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**BOOK RATE**

**Draft** **Environmental**  
**Impact Statement**  
**on the** **Book Cliffs Resource**  
**Management Plan**



*Prepared By*  
*Bureau of Land Management*  
*May 1984*



**U.S. DEPARTMENT OF THE INTERIOR**  
**BUREAU OF LAND MANAGEMENT**





# United States Department of the Interior

BUREAU OF LAND MANAGEMENT  
UTAH STATE OFFICE  
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IN REPLY REFER TO

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Dear Reviewer:

This Draft Environmental Impact Statement (DEIS) on the proposed Book Cliffs Resource Management Plan is submitted for your review and comment. It assesses the impacts of implementing four possible alternatives to be used in the future management of all natural resources on the public lands in the Resource Area.

We welcome your comments on the content of this document. Those comments addressing the adequacy of the scope of the draft EIS or the impact analyses will be responded to in the final EIS. Specific comments will be the most useful. Comments may be submitted in writing or presented verbally at a public hearing in Vernal on July 17, 1984. It will begin at 7:00 p.m. in the Vernal District Office Conference Room. In order to be considered in the final EIS, all comments must be received by September 6, 1984.

Please keep this copy of the draft EIS, as an abbreviated final EIS may be issued in accordance with the Council on Environmental Quality (CEQ) regulations. Copies of the final EIS will be sent to all those who provide comments on the draft EIS or request a copy.

All written comments should be sent to:

Mr. Curtis Tucker  
Book Cliffs Resource Management Plan Team Leader  
Bureau of Land Management  
170 South 500 East  
Vernal, UT 84078

Sincerely yours,

Roland G. Robison  
BLM Utah State Director



86001973

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DEPARTMENT OF THE INTERIOR

**DRAFT**

**BOOK CLIFFS RESOURCE**

**MANAGEMENT PLAN/ENVIRONMENTAL**

**IMPACT STATEMENT**

PREPARED BY  
VERNAL DISTRICT  
BUREAU OF LAND MANAGEMENT  
MAY 1984

*Richard R. Johnson*

UTAH STATE DIRECTOR







COVER SHEET  
BOOK CLIFFS RESOURCE MANAGEMENT PLAN

Draft (X)      Final ( )      Environmental Impact Statement

Lead Agency

U.S. Department of the Interior, Bureau of Land Management

Cooperating Agencies

None

Type of Action

Administrative (X)      Legislative ( )

Counties That Could Be Directly Affected

Utah

Duchesne County  
Grand County  
Uintah County

Colorado

Garfield County  
Mesa County  
Moffat County  
Rio Blanco County

Abstract

The Bureau of Land Management proposes to implement a formal Resource Management Plan for the Book Cliffs Resource Area in northeastern Utah. The objectives of the plan are to provide a framework to manage all resources on public lands. This environmental impact statement (EIS) analyzes the consequences of implementing the various components of four alternatives: (1) Current Management (No-Action), (2) Resource Protection, (3) Commodity Production, and (4) Balanced Use. The alternatives recommend levels of grazing for livestock, wildlife, and wild horses; identify woodland management areas; propose management of energy development; and recommend future recreation designations.

Based on the issues and concerns identified during the scoping process, this EIS focuses on impacts to minerals and minerals development, forage, water and watershed, wildlife and wildhorses, woodlands, recreation, and socioeconomics. A detailed description of the affected environment and analyses of impacts which would result from each alternative are identified in this document.

EIS Contact

Questions and comments on this EIS should be directed to:

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Vernal, Utah 84078  
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Date By Which Comments Must Be Received      September 6, 1984



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# Table of Contents

<b>SUMMARY</b> .....	xiii
Introduction .....	xiii
Areas Of Controversy .....	xiii
Issues To Be Resolved .....	xiii
Major Conclusions .....	xiii
Current Management Alternative .....	xiii
Resource Protection Alternative .....	xiii
Commodity Production Alternative .....	xiv
Balanced Use Alternative .....	xiv
<b>Chapter 1: PURPOSE AND NEED</b> .....	3
Introduction .....	3
Scope Of The Resource Management Plan .....	3
Interrelated Projects .....	3
Time Frame .....	3
Description Of The Study Area .....	3
Planning Process .....	6
Issues .....	6
Management Concerns .....	8
Authorizing Actions .....	9
Consistency Review .....	9
<b>Chapter 2: DESCRIPTION AND COMPARISON OF ALTERNATIVES</b> .....	13
Introduction .....	13
Alternatives Considered But Eliminated From Detailed Analysis .....	13
Alternatives Considered For Detailed Analysis .....	13
Formulation Criteria .....	14
Discussion Of Alternatives .....	14
Current Management Alternative .....	14
Resource Protection Alternative .....	40
Commodity Production Alternative .....	49
Balanced Use Alternative .....	60
Management Guidance Common To All Alternatives .....	69
General Support Needs .....	75
Actions Which Would Occur Regardless Of The Alternative Selected .....	75
Summary Of Environmental Consequences .....	75
Rationale For Preferred Alternative .....	84
<b>Chapter 3: AFFECTED ENVIRONMENT</b> .....	87
Introduction .....	87
Minerals .....	87
Right-Of-Way Corridors .....	99
Forage .....	99
Endangered, Threatened, Or Sensitive Plants .....	101
Wildlife And Wild Horses .....	103
Endangered Or Threatened Species .....	108
Woodlands .....	112
Recreation .....	112
Fire Management .....	117
Watershed .....	117
Land Tenure Adjustment .....	120
Air Resources .....	120
Cultural Resources .....	120
Paleontology .....	125
Socioeconomics .....	125
Transportation .....	132

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<b>Chapter 4: ENVIRONMENTAL CONSEQUENCES</b>	137
Introduction	137
Analysis Assumptions And Guidelines	137
General Assumptions	137
General Impacts	146
Specific Impacts	150
<b>CURRENT MANAGEMENT ALTERNATIVE</b>	150
Minerals	150
Right-Of-Way Corridors	150
Forage	153
Wildlife/Wild Horses	155
Woodlands	155
Recreation	156
Fire Management	156
Watershed	156
Land Tenure Adjustment	157
Air Quality	157
Socioeconomics	158
Transportation	158
<b>Unavoidable Adverse Impacts</b>	159
<b>Irreversible and Irretrievable Commitment of Resources</b>	159
<b>Short-Term Use Versus Long-Term Productivity</b>	159
<b>Cumulative Summary</b>	159
<b>RESOURCE PROTECTION ALTERNATIVE</b>	161
Minerals	161
Right-Of-Way Corridors	161
Forage	163
Wildlife/Wild Horses	165
Woodlands	165
Recreation	165
Fire Management	166
Watershed	166
Land Tenure Adjustment	168
Air Quality	168
Socioeconomics	168
Transportation	174
<b>Unavoidable Adverse Impacts</b>	174
<b>Irreversible and Irretrievable Commitment of Resources</b>	174
<b>Short-Term Use Versus Long-Term Productivity</b>	174
<b>Cumulative Summary</b>	176



<b>COMMODITY PRODUCTION ALTERNATIVE</b> .....	181
Minerals .....	181
Right-Of-Way Corridors .....	181
Forage .....	181
Wildlife/Wild Horses .....	183
Woodlands .....	184
Recreation .....	184
Fire Management .....	184
Watershed .....	185
Land Tenure Adjustment .....	185
Air Quality .....	185
Socioeconomics .....	186
Transportation .....	191
<b>Unavoidable Adverse Impacts</b> .....	191
<b>Irreversible and Irretrievable Commitment of Resources</b> .....	191
<b>Short-Term Use Versus Long-Term Productivity</b> .....	191
<b>Cumulative Summary</b> .....	192
<b>BALANCED USE ALTERNATIVE</b> .....	196
Minerals .....	196
Right-Of-Way Corridors .....	196
Forage .....	196
Wildlife/Wild Horses .....	198
Woodlands .....	199
Recreation .....	199
Fire Management .....	200
Watershed .....	200
Land Tenure Adjustment .....	201
Air Quality .....	201
Socioeconomics .....	201
Transportation .....	205
<b>Unavoidable Adverse Impacts</b> .....	205
<b>Irreversible and Irretrievable Commitment of Resources</b> .....	205
<b>Short-Term Use Versus Long-Term Productivity</b> .....	207
<b>Cumulative Summary</b> .....	207
<b>List of Abbreviations</b> .....	211
<b>Glossary</b> .....	213
<b>Reference Cited</b> .....	217
<b>List of Preparers</b> .....	221



## List of Figures

Figure 1-1 Vicinity Map .....	4
Figure 1-2 Land Ownership .....	5
Figure 1-3 Steps in the Resource Management Planning Process .....	7
Figure 1-4 Location of Wilderness Study Areas, Naval Oil Shale Reserve, and Reclamation and Power Site Withdrawals .....	10
Figure 2-1 Oil and Gas Leasing Categories (Current Management Alternative) .....	35
Figure 2-2 Areas With Applications to Convert Existing Oil and Gas Leases to Combined Hydrocarbon Leases .....	36
Figure 2-3 Sand and Gravel Areas (Current Management and Balanced Use Alternatives) .....	37
Figure 2-4 Building Stone Collecting Areas (Current Management, Commodity Production, and Balanced Use Alternatives) .....	38
Figure 2-5 Utility Corridors (Current Management Alternative) .....	39
Figure 2-6 Soil Erosion Condition Classes, Floodplains, and Watershed Study Area .....	41
Figure 2-7 Potential Land Disposals or Exchanges (Current Management, Commodity Production, and Balanced Use Alternatives) .....	42
Figure 2-8 Oil and Gas Leasing Categories (Resource Protection Alternative) .....	43
Figure 2-9 Oil Shale Priority Management Areas (Resource Protection Alternative) .....	44
Figure 2-10 Tar Sand Leasing Categories (Resource Protection Alternative) .....	46
Figure 2-11 Utility Corridors (Resource Protection Alternative) .....	47
Figure 2-12 Vegetative Treatments (Resource Protection Alternative) .....	48
Figure 2-13 Off-road Vehicle Designation (Resource Protection Alternative) .....	51
Figure 2-14 Potential Lands Acquisition (Resource Protection Alternative) .....	52
Figure 2-15 Oil and Gas Leasing Categories (Commodity Production Alternative) .....	54
Figure 2-16 Oil Shale Priority Management Areas (Commodity Production Alternative) .....	55
Figure 2-17 Tar Sand Categories (Commodity Production Alternative) .....	56
Figure 2-18 Sand and Gravel Areas (Commodity Production Alternative) .....	57
Figure 2-19 Utility Corridors (Commodity Production Alternative) .....	58
Figure 2-20 Vegetative Treatments (Commodity Production Alternative) .....	59
Figure 2-21 Off-road Vehicle Designation (Commodity Production Alternative) .....	61
Figure 2-22 Potential Lands Acquisition (Commodity Production and Balanced Use Alternatives) .....	62
Figure 2-23 Oil and Gas Categories (Balanced Use) .....	63
Figure 2-24 Oil Shale Priority Management Areas (Balanced Use Alternative) .....	64
Figure 2-25 Tar Sand Category (Balanced Use) .....	66
Figure 2-26 Utility Corridors (Balanced Use) .....	67
Figure 2-27 Vegetative Treatments (Balanced Use Alternative) .....	68
Figure 2-28 Off-road Vehicle Designation (Balanced Use Alternative) .....	70
Figure 3-1 Oil and Gas Favorability .....	89
Figure 3-2 Known Geologic Structures .....	90
Figure 3-3 Oil Shale Reserves .....	91
Figure 3-4 Known Oil Shale Lease Areas .....	92
Figure 3-5 General Expression of Interest for Oil Shale Placer Claims and Areas of Oil Shale .....	93
Figure 3-6 Special Tar Sand Areas .....	95
Figure 3-7 Tar Sand Resources (Having Moderate Potential) .....	96
Figure 3-8 Known Gilsonite Veins .....	98
Figure 3-9 Threatened, Endangered, or Sensitive Plants .....	102
Figure 3-10 Antelope Herd Locations and Crucial Habitat .....	106
Figure 3-11 Mule Deer Herd Locations and Crucial Habitat .....	107
Figure 3-12 Elk Herd Locations and Crucial Habitat .....	110
Figure 3-13 Wild Horse Crucial Yearlong Habitat and Sage Grouse Leks .....	111
Figure 3-14 Productive Woodland Management Areas .....	113
Figure 3-15 Camp Sites and Geologic Features .....	115
Figure 3-16 Scenic Travel Corridors, Overlooks, White River Canyon, Book Cliffs Mountain Browse Natural Area .....	116
Figure 3-17 Visual Resource Management Classes .....	118
Figure 3-18 Soil Types .....	119



## List of Tables

Table 2-1 Objectives and Actions of the Alternatives .....	15
Table 2-2 Management Alternatives-Recreation Actions, Hunter Camps, Scenic Overlooks, Sightseeing .....	50
Table 2-3 Summary of Environmental Consequences .....	76
Table 3-1 General Oil and Gas Production-Book Cliffs Resource Area.....	88
Table 3-2 Amount and Condition of Crucial Wildlife Habitat.....	104
Table 3-3 Visual Resource Management Classes .....	109
Table 3-4 Soils of the Book Cliffs Resource Area .....	121
Table 3-5 Personal Income and Employment Uintah and Duchesne Counties 1981 .....	126
Table 3-6 Summary of Regional Infrastructure Conditions .....	127
Table 3-7 Baseline and Interrelated Population Growth .....	128
Table 3-8 Summary of Fiscal Conditions for Affected Counties and Communities .....	130
Table 3-9 Uintah County's 1982 Mining Employment Breakdown.....	130
Table 3-10 Livestock Operations by Herd Size .....	131
Table 3-11 Aggregate Costs and Returns for Operators Who Use Book Cliffs Resource Area Forage .....	131
Table 3-12 Projected 1985 Baseline Average Daily Traffic Levels Chapter 4 .....	133
Table 4-1 Oil Shale Magnitude of Conceptual Development in Barrels Per Day.....	138
Table 4-2 Underground Oil Shale Mining-Magnitude of Conceptual Development in Acreage Disturbance .....	139
Table 4-3 In Situ Oil Shale Development-Magnitude of Development in Acreage Disturbance During Full Production .....	140
Table 4-4 Tar Sand-Magnitude of Conceptual Development in Barrels Per Day .....	142
Table 4-5 Tar Sand-Magnitude of Conceptual Development in Acreage Disturbance .....	143
Table 4-6 Sand and Gravel-Magnitude of Conceptual Development in Acreage Disturbance .....	144
Table 4-7 Acreage Conflicts Between Category Designations and Oil and Gas Favorability Areas.....	151
Table 4-8 Acreage Conflicts Between Category Designations and Producing Oil and Gas Areas (KGS's) .....	152
Table 4-9 Forage Impacts from Interrelated Projects .....	154
Table 4-10 Projected Average Daily Traffic Levels for Current Baseline and Interrelated Projects .....	160
Table 4-11 Tar Sand: Acreage Conflicts Between Category Designations and Potential Development Areas.....	162
Table 4-12 Water Requirements for Energy Development (acre-feet/year).....	167
Table 4-13 Population Projections for Resource Protection Alternative .....	170
Table 4-14 Resource Protection Alternative Summary of Regional Socioeconomic Impacts Resulting from BLM Actions .....	171
Table 4-15 Number of Operators Affected Under the Proposed Plan and Degree of Impact .....	173
Table 4-16 Summary of Short-term and Long-term Economic Impacts to Livestock Operators in Dollars .....	173
Table 4-17 Resource Protection Alternative Cumulative Infrastructure Needs BLM and Interrelated Projects ....	178
Table 4-18 Projected Average Daily Traffic Levels Caused by BLM Generated Impacts, By Alternatives, By Year 1995.....	175
Table 4-19 Cumulative Projected Average Daily Traffic Levels for Baseline, Interrelated and BLM Actions, By Alternatives, By Year 1995 .....	180
Table 4-20 Population Projections for Commodity Production Alternative .....	187
Table 4-21 Commodity Production Alternative Summary of Regional Socioeconomic Impacts Resulting from BLM Actions .....	188
Table 4-22 Number of Operators Affected Under the Proposed Plan and Degree of Impact .....	190
Table 4-23 Summary of Short-term and Long-term Economic Impacts to Livestock Operators in Dollars .....	190
Table 4-24 Commodity Production Alternative Cumulative Infrastructure Needs BLM and Interrelated Projects .....	194
Table 4-25 Balanced Use Alternative Summary of Regional Socioeconomic Impacts Resulting from BLM Actions .....	202
Table 4-26 Population Projections for Balanced Use Alternative.....	204
Table 4-27 Number of Operators Affected Under the Proposed Plan and Degree of Impact .....	206
Table 4-28 Balanced Use Alternative Cumulative Infrastructure Needs BLM and Interrelated Projects.....	209

<b>Appendix 1 Consultation and Coordination .....</b>	<b>A1-1</b>
---	-------------

<b>Appendix 2 Major Federal Authorizing Actions .....</b>	<b>A2-1</b>
---	-------------

<b>Appendix 3 Allotment Management Category Criteria .....</b>	<b>A3-1</b>
--	-------------



<b>Appendix 4 Specialized Mineral Terminology .....</b>	<b>A4-1</b>
<b>Appendix 5 Forage Actions by Alternatives.....</b>	<b>A5-1</b>
<b>Appendix 6 Campsites Identified in Previous Years for Possible Development .....</b>	<b>A6-1</b>
<b>Appendix 7 Scenic Overlooks and Geologic Features .....</b>	<b>A7-1</b>
<b>Appendix 8 Mitigating Measures for Land Treatments, Water Developments, and Management Facilities .....</b>	<b>A8-1</b>
<b>Appendix 9 Utility Corridor Segments by Alternative.....</b>	<b>A9-1</b>
<b>Appendix 10 Ecological Sites and Conditions by Locality.....</b>	<b>A10-1</b>
<b>Appendix 11 Allotment Statistics .....</b>	<b>A11-1</b>
<b>Appendix 12 Methodology for the Economic and Social Analysis .....</b>	<b>A12-1</b>
<b>Appendix 13 Prevention of Significant Deterioration Regulations and National Ambient Air Quality Standards .....</b>	<b>A13-1</b>
<b>Appendix 14 Anticipated Trend in Ecological Conditions.....</b>	<b>A14-1</b>
<b>Appendix 15 Forage Impacts .....</b>	<b>A15-1</b>
<b>Appendix 16 Anticipated Change in Ecological Condition Class .....</b>	<b>A16-1</b>
<b>List of Abbreviations .....</b>	<b>211</b>
<b>Glossary .....</b>	<b>213</b>
<b>References Cited .....</b>	<b>217</b>



# LIST OF AGENCIES AND ORGANIZATIONS

## REQUESTED TO COMMENT ON THE DRAFT EIS

BLM is requesting comments on this Draft EIS from the agencies and organizations listed below. Interested and/or affected individuals, private groups, and agencies are also invited to comment.

### FEDERAL AGENCIES

Army Corps of Engineers  
Environmental Protection Agency  
Federal Energy Regulatory Commission  
U.S. Department of Agriculture  
    Forest Service  
    Soil Conservation Service  
U.S. Department of Navy  
U.S. Department of Energy  
U.S. Department of the Interior  
    Bureau of Indian Affairs  
    Bureau of Mines  
    Bureau of Reclamation  
    Fish and Wildlife Service  
    Geological Survey  
    National Park Service  
    Office of Surface Mining

Natural Resources Defense Council  
Rocky Mountain Oil and Gas Association  
Sierra Club  
Utah Audubon Society  
Utah Cattlemen's Association  
Utah Geological Association  
Utah Mining Association  
Utah Water Resources Council  
Utah Wildlife Federation  
Ute Indian Tribe  
Wilderness Society  
Western Research Institute  
Wildlife Management Institute  
WHOA!

### EIS AVAILABILITY

Copies of this Draft EIS will be available for public inspection at the BLM offices listed below:

### UTAH STATE AGENCIES

Clearinghouse  
Department of Community and Economic Development  
Department of Transportation  
Department of Natural Resources and Energy  
Division of Lands  
Division of Oil, Gas, and Mining  
Division of State History  
Division of Water Resources  
Division of Wildlife Resources  
Geological and Mineral Survey  
Office of the State Planning Coordinator

#### Washington Office of Public Affairs

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#### Utah State Office

University Club Building  
136 East South Temple  
Salt Lake City, UT 84111  
Phone: (801) 524-4227

### LOCAL GOVERNMENT AGENCIES

Duchesne County Commission  
Roosevelt Chamber of Commerce  
Southeastern Association of Governments  
Uinta Basin Association of Governments  
Uintah County Commissioners  
Grand County Commission  
Garfield County Commission  
Mesa County Commission  
Moffat County Commission  
Rio Blanco Commission  
Vernal Chamber of Commerce

#### Richfield District Office

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#### Moab District Office

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Moab, UT 84532  
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### NONGOVERNMENT AGENCIES

American Fisheries Society  
Archaeological Society of Utah  
Council on Utah Resources  
Friends of the Earth  
National Woolgrowers Association  
National Wildlife Federation

#### Vernal District Office

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# SUMMARY

## INTRODUCTION

The Book Cliffs Resource Management Plan (BCRA) is being prepared as required by the Federal Land Policy and Management Act in accordance with the current planning regulations (43 CFR 1600). This plan will provide for the management of all resources on public lands within the Book Cliffs Resource Area of the Vernal District, Bureau of Land Management.

## AREAS OF CONTROVERSY

A total of nine issues were identified for resolution of possible resource use conflicts: mineral development; right-of-way corridors; forage; wildlife and wild horse habitat; woodland management; recreation; fire management; watershed management; and land tenure adjustment. Although the public has expressed interest in all of these issues, a few hold the greatest potential for public controversy. The timing, procedure, and location of Federal oil shale and tar sand leasing is of particular concern to industry. The impact of any subsequent developments upon the existing natural resources, including wildlife and wild horses, is of particular concern to hunting and environmental groups. The impacts of livestock grazing upon forage and other natural resources are of particular concern to the Natural Resources Defense Council, Inc. Any adjustments in livestock grazing use are of concern to livestock operators because their livelihood could be affected. Designation of public lands for off-road vehicular use is of concern to ORV users and nonusers.

## ISSUES TO BE RESOLVED

Four alternatives have been developed to provide guidance and direction in resolving the issues in this environmental impact statement. They are the Current Management, Resource Protection, Commodity Production, and the Balanced Use Alternatives. Each of the alternatives provides a series of solutions for each of the nine issues. The alternatives differ in their emphasis on resource uses, varying between development and nondevelopment. The Current Management Alternative would be a continuation of the existing BLM management in the BCRA, which is considered as a no action alternative. The Resource Protection Alternative would emphasize maintenance or improvement of environmental quality. Commodity Production would emphasize commercial utilization of resources and the revenues which could be produced from their use. The Balanced Use Alternative would provide for the use of nonrenewable resources while protecting critical renewable resources.

## MAJOR CONCLUSIONS

Implementation of any of the four alternatives could result in significant environmental impacts. These impacts are summarized by alternative in the following discussion.

## CURRENT MANAGEMENT ALTERNATIVE

Development of additional oil shale and tar sand resources would not be allowed under this alternative. Oil and gas leasing categories would remain as currently designated.

Approximately 61,500 acres of land within designated corridors would be subject to disturbance by rights-of-way construction.

Forage authorizations would remain unchanged. Ecological condition would improve on 490,500 acres in 12 allotments, remain unchanged on 588,400 acres in 35 allotments, and decline on 36,400 acres in 7 allotments. No forage would be authorized for wild horses. Approximately 576 animal unit months (AUMs) would be lost to mineral development.

Due to overharvest, approximately 220 acres of woodlands would be eliminated annually.

Continuation of no off-road vehicle (ORV) designations could result in nonconformance with plans of the Ute Tribe for the Hill Creek Extension. Hunter use in the Book Cliffs Resource Area would increase by 400 visitor days.

Within a decade, fire management would improve forage and wildlife habitat on 5,000 to 10,000 acres.

Watershed treatments on 10,000 acres would reduce soil loss by 64,000 tons.

## RESOURCE PROTECTION ALTERNATIVE

Development of oil shale would be considered on some 18,000 acres. Flexibility in locating up to two new oil shale tracts would be limited. In situ development would not be possible. Oil shale mining could inadvertently damage or destroy existing oil and gas facilities or gilsonite veins. Approximately 32 percent of STSAs would not be available for tar sand lease.

Approximately 46,000 acres of land within designated corridors would be subject to disturbance by rights-of-way construction.

Forage authorizations for livestock would be about 48 percent below active preference. Wildlife would be authorized a 27 percent increase. Wild horses would be authorized 2,940 AUMs above the current level of 0. Ecological condition would improve on 943,400 acres in 49 allotments and remain unchanged on 171,900 acres in 5 allotments. Approximately 1,181 AUMs would be lost through mineral development and 1,708 AUMs would be gained from land treatments.

Habitat and forage improvements would result in increases of 503 antelope, 12,100 mule deer, 1,800 elk, and 39 wild horses. Water depletions from the White River could adversely affect two endangered fish species.



Mineral development, fire, and rights-of-way would destroy 1,700 acres of woodlands. Protection of other resource values would preclude harvest of 12,800 acres of woodlands.

Hunting would increase by 4,050 visitor days and other recreation use would increase by 2,700 visitor days. ORV restrictions would cause a loss of 575 visitor days annually. Construction within designated corridors could diminish the visual resources on 4,640 acres.

Fire management would improve forage and wildlife habitat on 15,000 acres in a decade.

Diversion of an additional 28,000 acre-feet of water from the White River would increase the total dissolved solids (TDS) concentrations at Imperial Dam by 1 milligram per liter. Watershed treatments would reduce soil loss by 711,000 tons in a decade. Mineral developments would increase soil loss by 9,900 to 19,700 tons in a decade. Floodplains would improve by an unquantifiable amount.

Acquisition of 5,660 acres of riparian and wildlife habitat would enhance the wildlife program.

Air quality standards for total suspended particulates (TSP) could be exceeded near mines and haul roads.

Due to mineral developments, the regional employment and income would increase by an unknown amount. Decreasing the authorized grazing use by 49,542 AUMs would decrease operator wealth by \$2,972,520. Increased hunting activities would increase local revenue by \$288,325. Demands on community infrastructure would increase.

## **COMMODITY PRODUCTION**

Development of oil shale would be considered on some 98,000 acres and up to four new leases issued, thus giving maximum flexibility to possible oil shale development.

Oil shale development could inadvertently damage or destroy existing oil and gas facilities, gilsonite veins and building stone areas.

All public land within STSAs would be available for tar sand lease.

Approximately 174,000 acres of land within designated corridors would be subject to disturbance by rights-of-way construction.

Forage authorizations for livestock would be about 6 percent above active preference. Wildlife would be authorized 60 percent below allocated use. Wild horses would be authorized 710 AUMs above the current allocated level of none. Ecological condition would improve on 642,300 acres in 30 allotments and remain unchanged on 472,900 acres in 24 allotments. Approximately 3,856 AUMs would be lost to mineral development and 2,700 AUMs would be gained from land treatments.

Reduced forage for wildlife would result in decreases of 309 antelope, 400 mule deer, and 146 wild horses. Water depletions from the White River would adversely affect two endangered fish species.

About 20,400 acres of woodlands would be destroyed by mineral development, rights-of-way, and wildfire. Protection of other resource values would preclude harvest of 20 acres of woodlands.

The ORV designations would result in nonconformance with plans of the Ute Tribe for the Hill Creek Extension. The ORV restrictions would cause an annual loss of 200 visitor days.

Hunting would increase by 1,560 visitor days and other recreation use would increase by 5,900 visitor days. The Musket Shot Springs developed overlook would be eliminated. Construction within designated corridors could diminish the visual resources on 13,400 acres. Water depletions from the White River would result in marginal canoeing opportunities.

Fire management would increase livestock forage and decrease wildlife habitat on 13,000 to 28,500 acres.

Diversion of an additional 56,000 acre-feet from the White River would increase the TDS concentrations at Imperial Dam by 2 milligrams per liter. Watershed treatments would reduce soil loss by 41,000 tons in a decade. In a decade, mineral developments would increase soil loss by 45,800 to 81,500 tons.

Acquisition of 10,000 acres of oil shale and tar sand lands would enhance mineral management.

Air quality standards for TSP would be exceeded. Visible discoloration would occur to the Uintah and Ouray Indian Reservation. Discoloration could also occur to the Dinosaur and Colorado National Monuments.

Due to mineral developments, the regional employment and income would increase by an unknown amount. Increasing the authorized grazing use by 7,406 AUMs would increase operator wealth by \$444,360. Increased hunting activity would increase local revenues by \$335,700. Demands on community infrastructure would increase. Traffic would increase by 16 percent and there would be an unknown increase in traffic accidents. An undetermined amount of traffic congestion and road deterioration would also occur.

## **BALANCED USE**

Development of oil shale would be considered on 48,000 acres and up to four new leases issued.

Oil shale development could inadvertently damage or destroy existing oil and gas facilities, gilsonite veins, and building stone. Approximately 12 percent of STSAs would not be available for tar sand lease. Approximately 93,000 acres of land within designated corridors would be subject to disturbance by rights-of-way construction.

Forage authorizations for livestock would be about 35 percent below active preference. Wildlife would be authorized 9 percent above allocated use. Wild horses would be authorized 2,340 AUMs above the current allocation level of 0. Ecological condition would improve on 846,900 acres in 38 allotments and remain unchanged on 268,500 acres in 16



allotments. Approximately 1,858 AUMs would be lost through mineral development and 2,034 AUMs would be gained from land treatments.

Habitat and forage improvements would result in an increase of 289 antelope, 9,600 mule deer, and 1,400 elk. Reduced forage for wild horses would result in a decrease of 11 horses. Water depletions from the White River could adversely affect two endangered fish species.

Mineral developments, rights-of-way, and wildfire would destroy 5,150 acres of woodlands. Protection of other resources would preclude harvest on 4,750 acres of woodlands.

For the Hill Creek Extension, off-road vehicle designations would be consistent with plans of the Ute Tribe. The ORV restrictions would cause a loss of 500 visitor days annually. Hunting use would increase by 3,350 visitor days and other recreation use would increase by 4,700 visitor days. The Musket Shot Springs developed overlook would be eliminated. Construction within designated corridors could diminish visual resources on 6,400 acres. Water depletions from the White River would result in marginal canoeing.

Fire management would increase livestock forage and wildlife habitat on 17,000 to 27,900 acres.

Diversion of an additional 28,000 to 56,000 acre-feet of water from the White River would increase TDS concentrations at Imperial Dam by one to two milligrams per liter. Watershed treatments would reduce soil loss by 505,000 tons in a decade. Mineral developments would increase soil loss by 16,800 to 34,800 tons of soil in a decade.

Acquisition of up to 5,800 acres of riparian and wildlife habitat and potential recreation sites would enhance the wildlife and recreation programs.

Air quality standards for TSP would be exceeded. Visible discoloration could occur to the Dinosaur National Monument and Uintah and Ouray Indian Reservation.

The regional employment and income would increase by an unknown amount due to mineral developments. Decreasing the authorized grazing use by 35,992 AUMs would decrease operator wealth by \$2,159,520. Increased hunting activity would increase local revenues by \$450,450. Demands on community infrastructure would increase. Traffic would increase by 13 percent and accidents would increase by an unknown amount. An undetermined amount of traffic congestion and road deterioration could occur.

## **IDENTIFICATION OF THE PREFERRED ALTERNATIVE**

The Balanced Use Alternative has been identified as the preferred alternative because it optimizes the use of energy and other natural resources while protecting critical resources such as wildlife habitat, cultural resources, endangered and threatened species, etc.

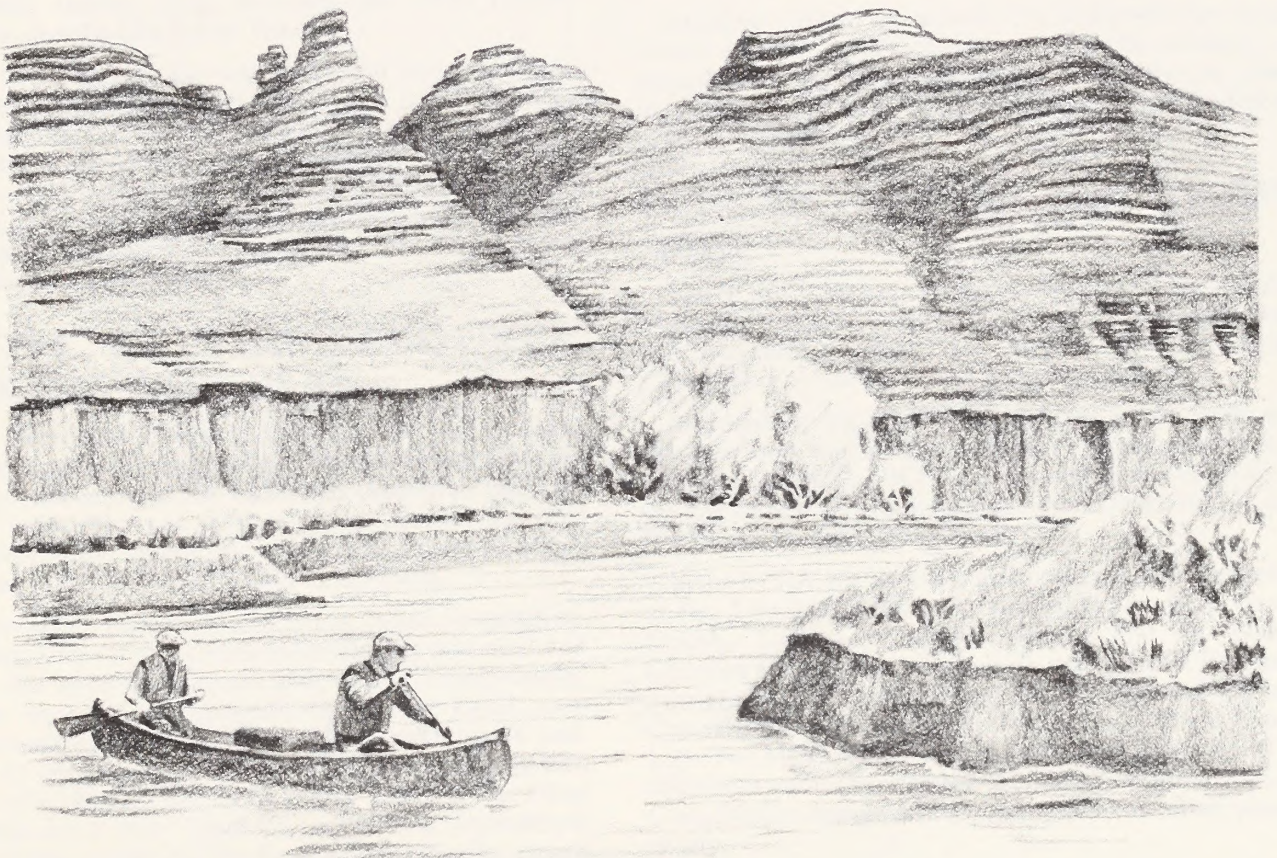
The Current Management Alternative presented in this document is the proposed action for livestock grazing as required by the Council on Environmental Quality (CEQ). This alternative is also the "No Action" Alternative as required by BLM grazing policy (BLM Washington Office Instruction Memo 83-428).





# Chapter 1

## Purpose and Need







# CHAPTER 1

## PURPOSE AND NEED

### INTRODUCTION

This document serves two functions: it proposes a Resource Management Plan (RMP) and determines the effects of implementing the plan through an Environmental Impact Statement (EIS).

The Book Cliffs RMP is a proposed land use plan for management of all natural resources on 1.1 million acres of public lands. It complies with the Federal Land Policy and Management Act (1976), as well as other appropriate planning mandates, (43 CFR 1600) and replaces the outdated Management Framework Plans which were developed during the early 1970s. The RMP provides planning direction for resolving conflicts between competing resource uses such as minerals, recreation, wildlife, etc. Provisions for leasing additional Federal energy minerals such as oil shale and tar sand are identified in the plan. The RMP also coordinates management of the public lands with existing plans of State, and other Federal agencies, and the Ute Indian Tribe.

This EIS assesses the environmental impacts of the proposed plan and identified alternatives. It also complies with the court order (U.S. District Court, District of Columbia, *Natural Resources Defense Council, Inc., et al. v. Rogers C.B. Morton et al.*, Case #1983-73) to analyze the impacts of livestock grazing on the public lands. Mitigation and monitoring recommended in this EIS will be incorporated into the final RMP.

### SCOPE OF THE RESOURCE MANAGEMENT PLAN

This document discusses both present and possible future options for Federal surface and subsurface resource management in the Book Cliffs Resource Area (BCRA). State, native-American, and private properties are only discussed to the extent that their management interacts with that of the Bureau of Land Management.

Lands within the Uintah and Ouray Indian Reservation, including Federal subsurface minerals, are not analyzed within this document. Inventories of the Tribally-owned surface resources are presently incomplete. Legal questions concerning access for mineral developments and adequate protection of the surface resources have also been raised by the Ute Tribe (Core 1984). After these concerns have been resolved, a planning amendment covering management of the Reservation subsurface lands administered by BLM would be prepared as an addendum to the Book Cliffs RMP.

The decisions identified in the RMP would apply to all public lands within this resource area and any lands subsequently added to it.

### INTERRELATED PROJECTS

This document assesses the environmental impacts which could result from actions approved by the BLM in the Book Cliffs Resource Area. Other projects, which have previously been approved by BLM or which could occur on non-Federal lands, have been evaluated in separate environmental documents. In this document, these projects have been identified since they would combine with the proposed BLM projects to create cumulative impacts. These cumulative impacts would only occur if all projects, both BLM and non-BLM, are actually developed concurrently.

### TIME FRAME

Based on current regulations, the proposed plan would remain in effect until it is determined to be outdated by management. If significant changes occur in the proposed land uses of the BCRA, the plan would be amended or revised.

### DESCRIPTION OF THE STUDY AREA

The BCRA is located in northeastern Utah. It is roughly triangular in shape, bounded by the Utah Colorado state line on the east, the Book Cliffs Divide to the south, and the Green River to the north and west (Figure 1-1).

Administratively, the BCRA includes public lands and minerals that are within portions of Uintah and Grand Counties, Utah. The BCRA also includes administration of grazing allotments which overlap into Garfield, Moffat, and Rio Blanco counties in Colorado.

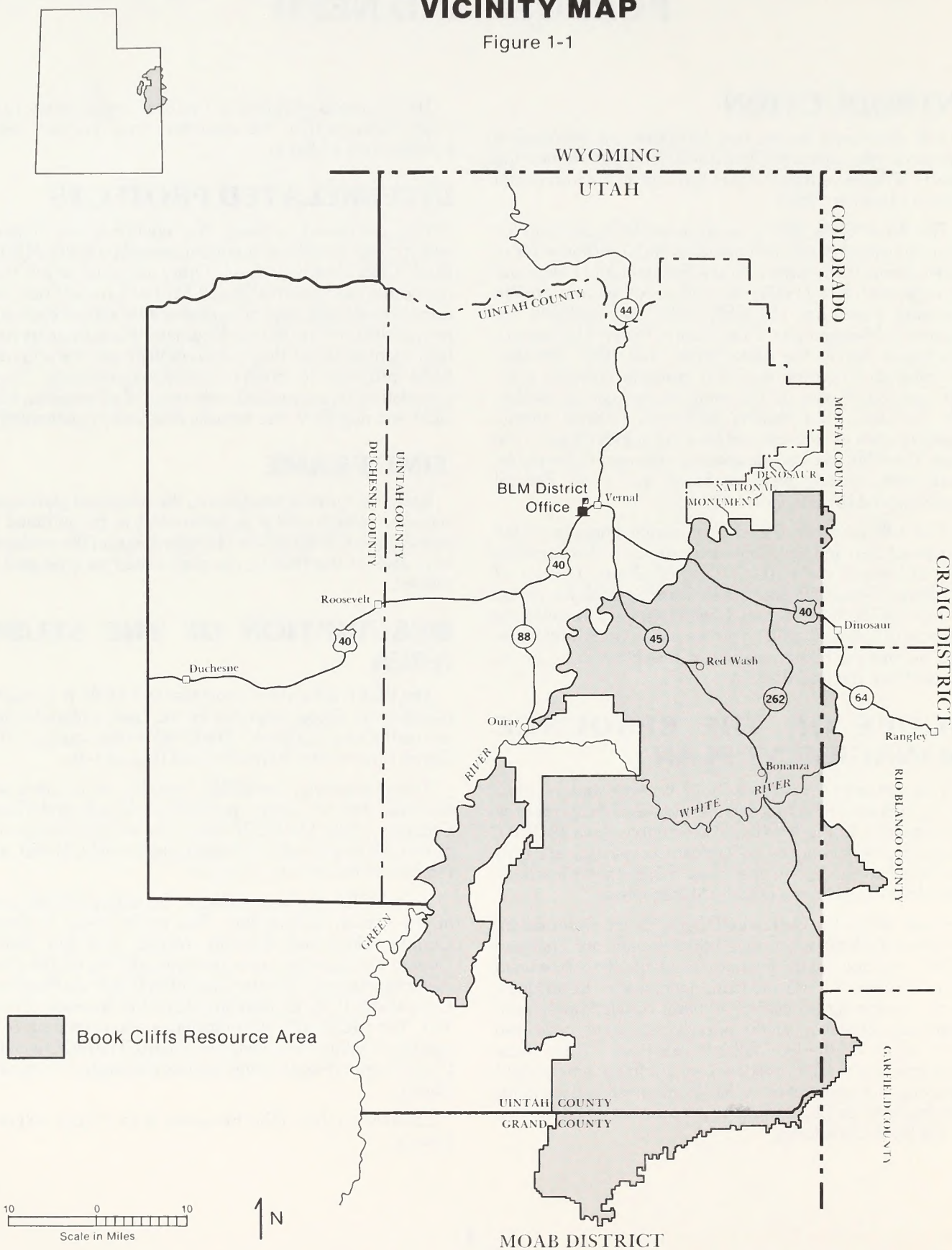
In the BCRA, the Vernal District boundary officially ends at the Uintah County line. The public lands in Grand County, Utah and Garfield, Moffat, and Rio Blanco Counties in Colorado are administered by the BCRA under memorandum of understanding (MOU) with the Moab and Craig District Offices, Bureau of Land Management (Figure 1-1). The MOU with Moab includes administration of all resources within the adjusted boundary. The MOU with the Craig District delegates only grazing administrative responsibility.

Land ownership in this Resource Area (Figure 1-2) is as follows:



# VICINITY MAP

Figure 1-1





# LAND OWNERSHIP

Figure 1 - 2



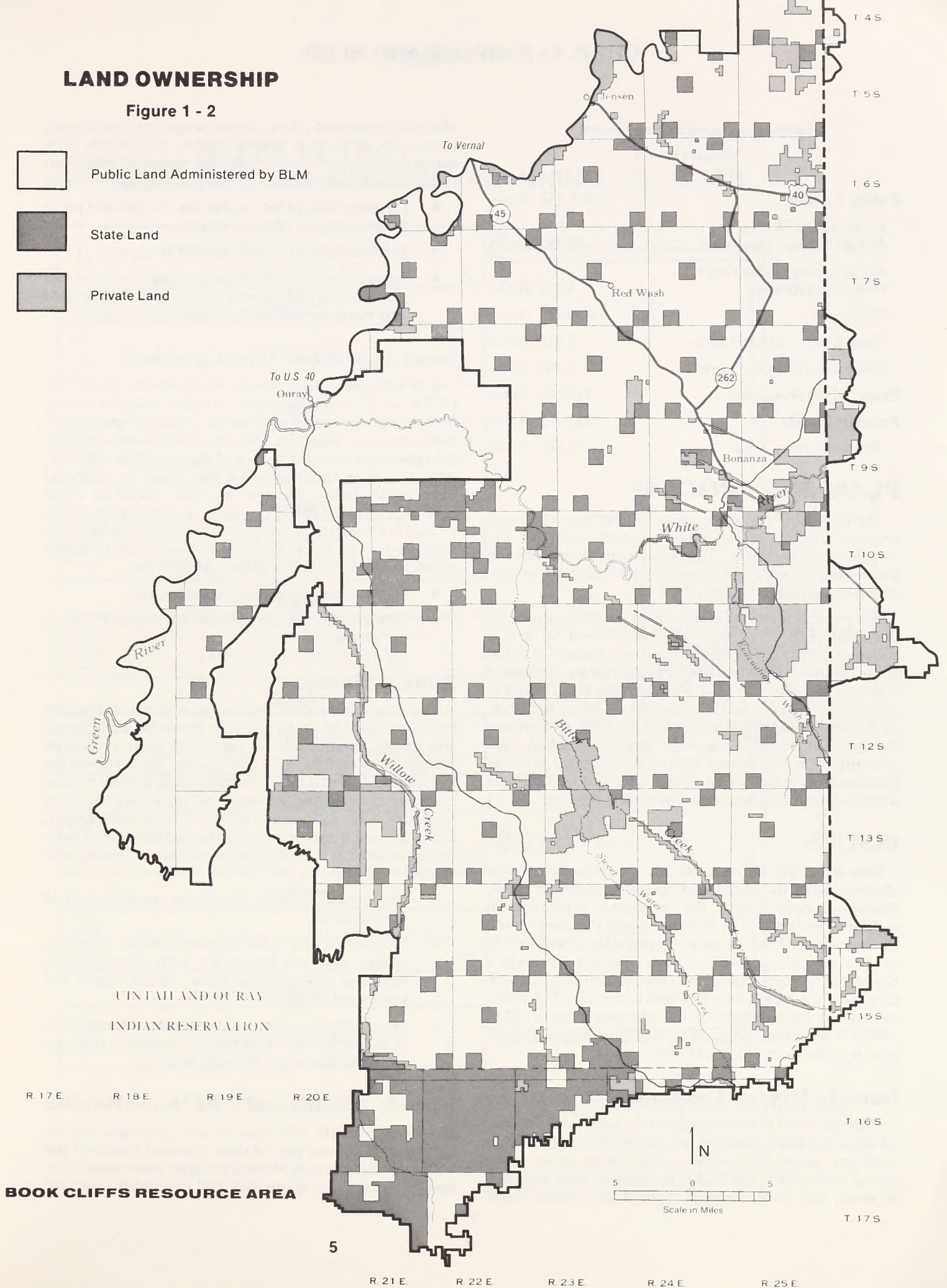
Public Land Administered by BLM



State Land



Private Land



UINTAH AND OURAY  
INDIAN RESERVATION

BOOK CLIFFS RESOURCE AREA



## CHAP. 1 - PURPOSE AND NEED

### Bureau of Land Management

#### Vernal District

<b>Public Lands</b>	1,027,167 Acres
Public Lands Within	
Naval Oil Shale Reserve II	46,152 Acres
Public Lands Under Federal	
Power Site Reserve	6,633 Acres
Subtotal	1,079,952 Acres
Craig District-Public Lands	32,218 Acres
Moab District-Public Lands	3,284 Acres
<b>State of Utah Lands</b>	216,646 Acres
<b>Private Lands</b>	123,780 Acres
Resource Area Total	1,455,880 Acres

## PLANNING PROCESS

The BLM RMP process consists of nine basic steps and requires the use of an interdisciplinary team for the completion of each step. The planning steps described in the regulations and used in preparing this plan are graphically summarized in Figure 1-3.

The public is invited to comment on the adequacy of this draft RMP/EIS. The draft will be followed by a final document which will include changes and responses to the public comments. The final RMP/EIS will indicate a proposed resource management plan. Persons who participated in the planning process and have an interest which is, or may be, adversely affected by approval of the RMP, may protest the approval. *Protests may only raise issues which were submitted for the record during the planning process.* Protests shall be filed within 30 days after the final RMP/EIS is filed with the Environmental Protection Agency.

## ISSUES

Nine issues are addressed in this document. They were identified from the public and county government input, interagency consultations, the judgment of planning team members, and reviews by BLM managers. Planning criteria were developed for each issue to give guidance and identify constraints that could limit possible solutions. Appendix 1 describes the consultation and coordination involved with determining issues to be addressed in this EIS. The public assisted in development of the planning criteria (BLM 1983a). The various criteria that were used are available for review at the Vernal District Office.

### Issue 1: Mineral Development

If development of leaseable minerals, such as oil and gas, oil shale, tar sand, gilsonite, and salable minerals, such as sand and gravel and building stone occur at an accelerated pace within the BCRA in order to meet national, regional, and local demand, mineral operations would

affect other resource values such as forage, water resources, recreation, air, critical wildlife habitat, and others. Mitigation developed to protect renewable resources could also restrict mineral development. Decisions to be made include:

- Determination of the number and locations of priority use areas for oil shale leasing,
- Establishment of salable mineral areas, and
- Assignment of mineral leasing categories for oil and gas, tar sand and gilsonite on all Federally managed land possessing mineral development potential.

### Issue 2: Right-of-Way Corridors

It is anticipated that mineral development, within the BCRA, would increase demand for rights-of-way to accommodate roads, energy and water pipelines, power and communication lines, etc. The opportunity exists to designate preferred areas for utility and transportation rights-of-way, as well as exclusion areas that would be protected from rights-of-way. Location of these corridors could conflict with other resource values. If corridors could be located in areas that are void of other resource conflicts, the time required for issuance of rights-of-way could be significantly reduced. Decisions to be made include:

- Designation of preferred corridors, and
- Designation of areas where rights-of-way would be prohibited.

### Issue 3: Forage

There is competition for forage and a potential for increased demand on forage from livestock, wild horses, and wildlife, particularly in key areas such as canyon bottoms, riparian habitat, and crucial big game winter ranges (BLM 1983a). This competition is further complicated by the removal of forage by increasing big game populations, oil and gas and other minerals development, and utility and transportation corridors. Wild horses were not considered in the initial forage allocation. Decisions to be made include:

- Determination of desired forage conditions on all grazing lands,
- Establishment of initial stocking rates for livestock, wildlife, and wild horses for each allotment with emphasis on key livestock use, wildlife habitat, and watershed areas; and
- Monitoring the effects of initial stocking rates and grazing practices on the soil and vegetation resource to determine proper stocking levels.

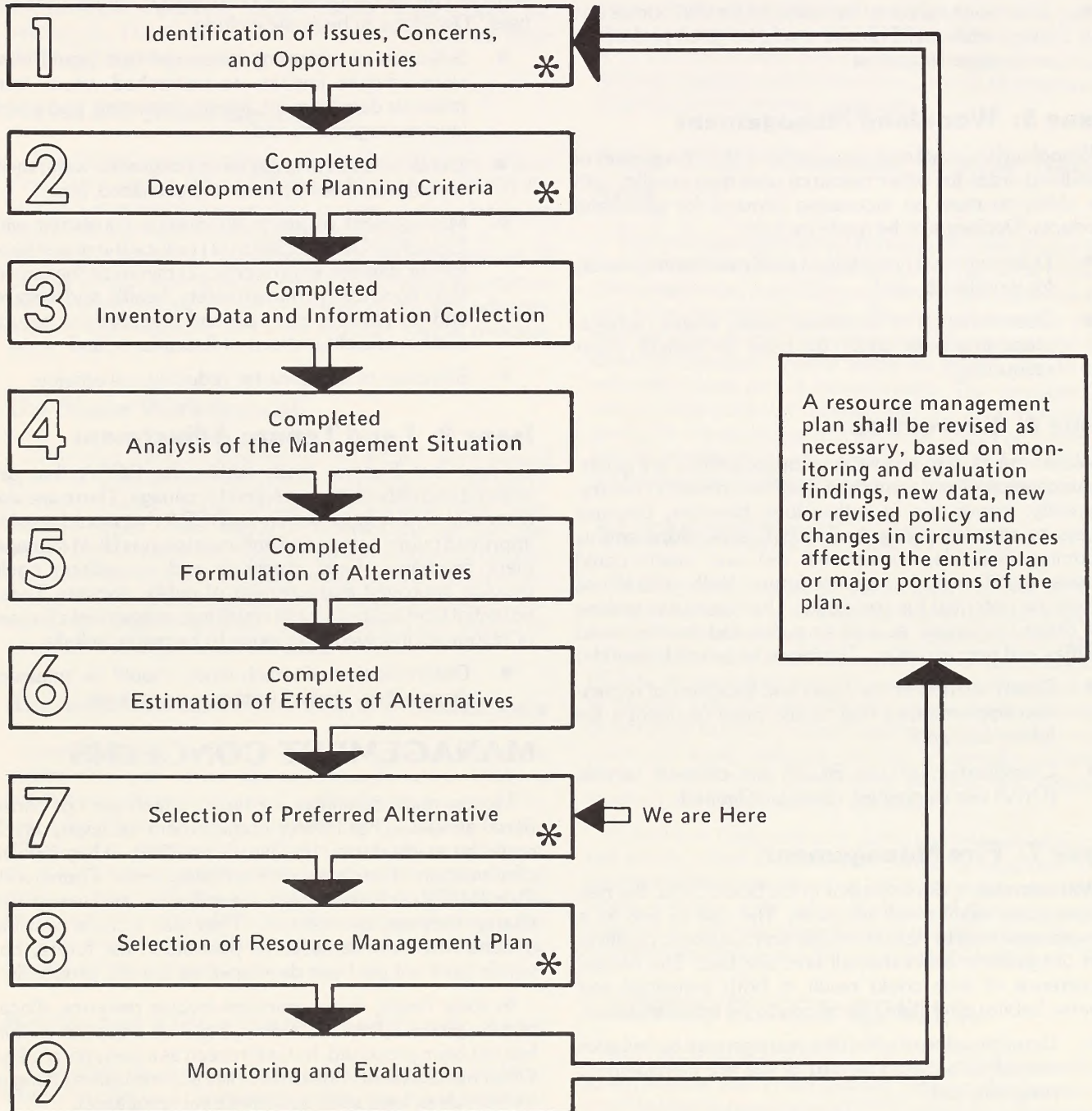
### Issue 4: Wildlife and Wild Horse Habitat

A conflict exists with current and proposed mineral development (oil and gas, oil shale, tar sand, gilsonite) and wildlife and wild horses. Mineral activities often result in the loss of habitat and space required by wildlife and wild



Figure 1-3

## STEPS IN THE RESOURCE MANAGEMENT PLANNING PROCESS



\* Steps Requiring Public Participation



## CHAP. 1 - PURPOSE AND NEED

horses. Competition for water, space, and cover also exists between livestock and wildlife and wild horses (BLM 1983a). Decisions to be made include:

- Determination of areas to be managed for wildlife priority over other resource values, and
- Selection of areas to be managed for wild horses and areas where wild horses would be given preference over other resources.

### Issue 5: Woodland Management

Woodlands are a finite resource and the conversion of woodland areas for other resource uses may conflict with the ability to meet an increasing demand for woodland products. Decisions to be made include:

- Determination of sustained yield management areas for woodlands, and
- Determination of woodland areas where management practices could be used to benefit other resources.

### Issue 6: Recreation

Within the BCRA, recreational opportunities are generally undeveloped and semi-primitive—motorized in nature. Presently, visitor use is rather low; however, because access to support energy and minerals developments is becoming available, recreational use and needs could increase significantly in the near future. With greater use comes the potential for competition between user groups and other resources, as well as a demand for improved facilities and opportunities. Decisions to be made include:

- Determination of the types and locations of recreation opportunities that would need protection for future use, and
- Classification of the BCRA for off-road vehicle (ORV) use as opened, closed, or limited.

### Issue 7: Fire Management

With increasing development in the Book Cliffs, the risk of loss from wildfire will increase. The use of fire as a management tool to benefit wildlife and livestock, conflicts with the public's belief that all fires are bad. The annual occurrence of fires could result in both beneficial and adverse habitat alteration. Decisions to be made include:

- Determination of which fire management techniques should be adopted as part of the fire management program, and
- Determination of where these techniques will be applied and what results are desired.

### Issue 8: Watershed Management

Water quality and soil erosion problems including high salinity, sediment, gully headcutting, and flood damage

have been identified (BLM 1983a). Restrictions on other resource uses can often maintain existing watershed values, while restorative measures may be necessary in already degraded areas. Springs and seeps are important water sources for livestock, wildlife, and wild horses. These water sources can be degraded or destroyed by other resource uses. Decisions to be made include:

- Selection of mitigating measures that would minimize adverse impacts to watershed values from minerals development, livestock grazing, and woodland management; and
- Determination of areas where degraded watersheds would/could be restored and stabilized; and
- Management of major floodplains consistent with Executive Order 11988 to (1) reduce the risk of flood loss or damage to property; (2) minimize the impact from flood loss to human safety, health, and welfare; and (3) restore, maintain and preserve the natural and beneficial functions of floodplains; and
- Selection of locations for reducing soil erosion.

### Issue 9: Land Tenure Adjustment

There are Federal lands within the BCRA that are isolated and difficult to reach and to manage. There are also State and private lands within the BCRA that would provide improved public access and enhance various BLM management programs. Land disposals and acquisition could provide improved management of public domain. These potential land actions would result in management changes of resources involved. Decisions to be made include:

- Determination of which lands should be retained, disposed of, studied further, or acquired.

## MANAGEMENT CONCERNS

Management concerns are topics which are not considered as issues, but involve management decisions which could be made during the life of the RMP. They involve continuation of certain existing Management Framework Plan (MFP) decisions which are still valid and would not change between alternatives. They also include possible actions which are foreseen as possible in the future, but which have not yet been developed as specific proposals.

In some cases, these concerns involve resource allocation on a conceptual basis only, because a specific action has not been proposed, but is foreseen as a likely possibility. Other management concerns involve administrative changes for parcels of land such as withdrawal revocation.

### Leasing Public Lands for Support Facilities

When anticipated mineral developments occur in the BCRA, it is likely that the BLM will receive one or more



## CHAP. 1 - PURPOSE AND NEED

applications to lease tracts of public land for support service facilities. Examples of applications could include gas stations and possibly town sites to accommodate workers in the oil shale and tar sand industry.

Without a specific application, it is not possible to analyze the potential impacts of support facility leasing upon the resources. The determination of impact would be done during future site-specific analyses.

### Naval Oil Shale Reserve II

The BCRA contains approximately 46,000 acres of land designated as the Naval Oil Shale Reserve II (NOSR II). NOSR II was created to protect certain oil shale lands for future use by the Navy (BLM 1983b) (Figure 1-4). NOSR II is presently administered by the Department of Energy (DOE), but managed by the BLM under a cooperative agreement (Evans 1984). Because of the joint administrative responsibilities, this area requires special management.

### Oil Shale Withdrawal

Extensive tracts of land within the BCRA were placed under oil shale withdrawal in 1930 (Executive Order 5327). In recent years, legislation and regulations have been enacted which could effectively protect the mineral and other natural resources, while being less restrictive on mineral developments. The oil shale withdrawal may be continued or lifted (Paugh 1984). Continuation of the withdrawals would require different management than would be needed if the withdrawals are lifted.

### Reclamation and Power Site Withdrawals

Lands adjacent to the Green River were placed under reclamation and power site withdrawals in the 1960s in anticipation of construction of hydroelectric projects (Figure 1-4). These projects appear highly unlikely today. Although not established for this purpose, these withdrawals afford protection of the river environment by precluding mining. These withdrawals may be lifted in 1984, and the areas opened to mineral entry. Revocation of these withdrawals would require different management than would be needed if they are continued.

### Boulevard Ridge Watershed Study Area

This 330-acre area was established in 1971 by BLM to study the effects of chaining on water runoff and sediment movement. The data are currently being analyzed to determine if the study should be continued. Management will need to decide whether the area would subsequently be made available for other resource uses, or be used for continued study purposes.

### Geothermal Leasing

The BCRA would remain open to lease consistent with the Geothermal Steam Act of 1970. One area, T. 4 S., R. 24 E., Salt Lake Base and Meridian (SLBM), Sections 33 and 34, has been identified as potentially valuable for geothermal steam development (BLM 1974a). Although the BCRA is considered to have a low potential for geothermal development, leasing could occur through a BLM initiative or in response to an industry proposal.

### Book Cliffs Mountain Browse Natural Area

This area was established October 29, 1968, by the BLM, to preserve a vegetation type unique to the Book Cliffs. It is composed of an association of several plant species referred to as mountain browse. The natural area has no real interest value to most recreationists. Because of the abundance of mountain browse within the BCRA, its value as a scientific study plot is questionable. The designation of natural area could be retained and the area managed primarily for its ecological and scientific values or, based on a lack of interest in the area for further scientific studies, the protective natural area designation could be dropped.

## AUTHORIZING ACTIONS

BLM's management of public lands in the BCRA is related to projects or management practices of other Federal, State, and local agencies, and, to some extent, private industry. Because BLM manages most of the lands in the BCRA, its practices strongly influence State and private lands that are interspersed with public lands. Therefore, BLM needs to closely coordinate its efforts in order to meet goals and avoid resource conflicts. Appendix 2 identifies some of the major authorizing actions that would be involved with implementing the RMP.

In addition, Federal law or policy identifies several activities which, when encountered during development of an environmental assessment or EIS, require a formal consultation process with other Federal or State agencies. Appendix 2 also identifies some of the resources requiring formal consultation and the agency to be consulted.

## CONSISTENCY REVIEW

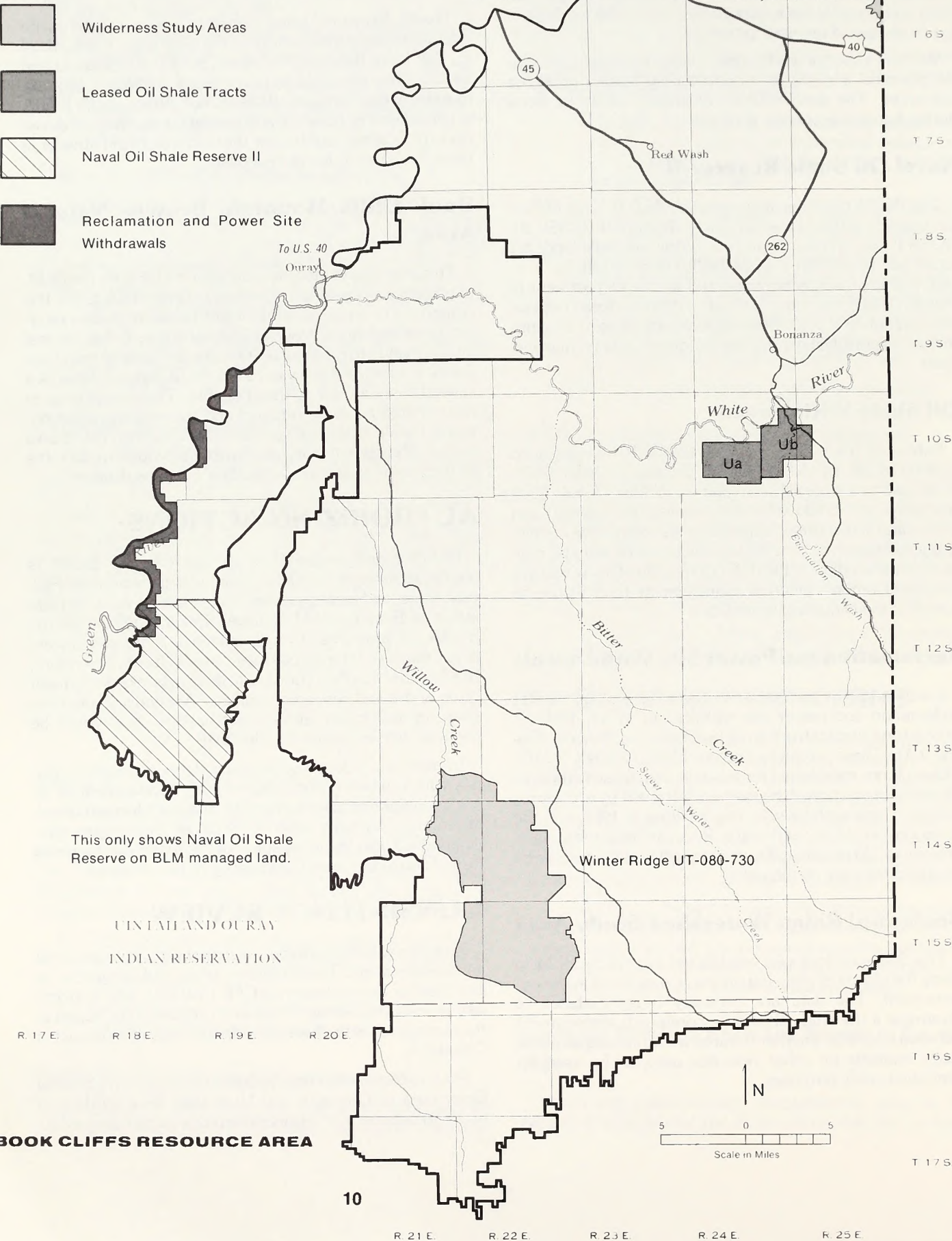
This plan is intended to be consistent with State and local governmental and Tribal policies, plans and programs, as provided for by regulation (43 CFR 1610.3-2). Where inconsistencies result from an alternative presented in Chapter 2, the inconsistency has been identified as a resulting impact in Chapter 4.

Prior to approval of this resource management plan, the Governors of Colorado and Utah shall have 60 days in which to comment on any inconsistencies which may exist.



**LOCATION OF WILDERNESS STUDY AREAS,  
NAVAL OIL SHALE RESERVE II, RECLAMATION  
AND POWER SITE WITHDRAWALS**

Figure 1 - 4





# Chapter 2

## **Description and Comparison of Alternatives**









# **CHAPTER 2**

## **DESCRIPTION AND COMPARISON OF ALTERNATIVES**

### **INTRODUCTION**

This chapter describes four resource management plan alternatives:

- Current Management (No-Action) Alternative
- Resource Protection Alternative
- Commodity Production Alternative
- Balanced Use Alternative

These alternatives and the environmental consequences of each will be used by the BLM to determine future resource management for the Book Cliffs Resource Area. The decision makers may select a final plan from one or more of the alternatives discussed in this EIS. In addition to the four alternatives, other alternatives that were initially considered during the early planning stages, but were not analyzed in this EIS, are briefly discussed.

### **ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS**

#### **No Grazing Alternative**

The no grazing alternative would have eliminated all livestock grazing from public land. This alternative was considered but eliminated from detailed study for the following reasons:

1. An ecological condition inventory (BLM 1982) of the BCRA indicates that 6.5 percent of the public grazing lands are in excellent condition, 59.6 percent are in good condition, 32.6 percent are in fair condition, and 1.3 percent are in poor condition. These range conditions do not warrant a resource area wide elimination of livestock grazing.
2. An extensive program of fence construction would be required to exclude livestock from public land. Cost of exclusion fencing would be prohibitive. In addition, fencing would disrupt established wildlife movement and public access.
3. The elimination of livestock grazing on public lands would seriously affect the ability of current livestock permittees to maintain their operations and earn a livelihood from ranching.

Various management actions, including elimination of livestock grazing on critical problem areas to improve ecological conditions, are identified for each of the four alternatives. However, total elimination of livestock could not be justified as a means of improving ecological conditions on grazing lands.

#### **Wilderness/ACEC Designation Alternatives**

Two wilderness study areas (WSAs) are located within the BCRA: Bull Canyon WSA (UT-080-419/CO-010-001) and Winter Ridge WSA (UT-080-730) (Figure 1-4). Their suitability for wilderness designation and the impacts of designation or non-designation will be given detailed analysis in separate documents and not in this statement. Both wilderness study areas would be managed as wilderness under the Current Management Alternative, following interim management guidelines (BLM 1979) or if legislatively approved by Congress, under a subsequent management plan as a designated wilderness area. The only land uses permitted would be those that would be nonimpairing to the wilderness characteristics. In the event that Congress determines that the areas are not wilderness, the BLM would then implement one of the other three alternative which include non-wilderness actions.

Another alternative would have evaluated resources within the BCRA for possible designation as Areas of Critical Environmental Concern (ACEC). The "relevance and importance" criteria for ACEC designation were applied to four potential areas (BLM 1980). Crucial wildlife habitat for deer on Lower McCook Ridge and scenic values of the White River and Fantasy Canyon were determined to be relevant but were not considered to be of more than local importance. Habitat for the endangered Colorado squawfish in the Green and White Rivers met both the relevance and importance criteria. However, appropriation of water from the rivers and management of fish species are the responsibilities of the states of Utah and Colorado. BLM is required by Executive Orders 11988 and 11990 to protect floodplains and wetlands associated with the river habitat. Additionally, in 1982, BLM required several Colorado squawfish conservation measures as conditions of the right-of-way grant for White River Dam.

BLM does not have the authority to play a major role in the management and protection of these fish species, and therefore, ACEC designation would not afford greater protection (Evans 1983).

### **ALTERNATIVES CONSIDERED FOR DETAILED ANALYSIS**

The four proposed alternatives are intended to provide realistic choices between development and non development of the natural resources. The differences in management philosophy are described as part of the goal of each alternative.

The Current Management Alternative would be a continuation of the existing BLM management in the BCRA. Ongoing resource activities such as oil and gas leasing, livestock grazing, firewood cutting, watershed



## CHAP. 2 - DESCRIPTIONS AND COMPARISONS OF ALTERNATIVES

treatment, and off-road vehicle (ORV) use, would continue at the present level. No additional oil shale or tar sand leasing would occur.

The Resource Protection Alternative would emphasize maintenance or improvement of environmental quality. While resource uses and developments would still occur, preference would be given to long-term maintenance of the natural environment. Resource trade-offs would favor protection of renewable natural resources through more restrictive stipulations and authorizations.

The Commodity Production Alternative would emphasize commercial utilization of resources and produce the greatest revenues from them. Maintenance of natural environments would continue where compatible with resource production and where mandated by law. Resource trade-offs would favor maximizing revenue and providing for human needs.

The Balanced Use Alternative would provide for the use of non renewable resources while protecting critical renewable resource values. Resource trade-offs would provide a balance between commercial production and protection of protection of resources.

### FORMULATION CRITERIA

Formulation criteria were identified and applied to all of the alternatives and provided general guidance in formulating the plan. The formulation criteria also provided aid in developing alternatives that cover a range of possible management solutions to the issues.

All alternatives will assume a continuation of oil and gas leasing, however, leasing categories may be different.

All alternatives will provide levels of protection for cultural resources, habitat for endangered or threatened species, floodplains, riparian habitat and other resources as prescribed by law or executive order.

Each alternative will provide a reasonable set of answers to the issues. All solutions will be technologically feasible and achievable within anticipated BLM budgets.

All alternatives will reflect the sustained-use principle for renewable resources.

The alternatives will display a maximum range of management practices to provide an array of different management options.

No alternatives will contain contradictory management practices which are mutually exclusive, i.e. maximization of conflicting uses.

Alternatives that provide for additional oil shale leasing will identify priority use areas that have realistic potential for economic shale oil recovery while avoiding major adverse impacts to renewable resources.

As provided by law, tar sand development shall be limited to the Special Tar Sand Areas (STSA). Competitive leasing will be limited to lands that are unleased within the STSAs.

Rights-of-way corridors will be developed using existing corridors and planning corridors. Existing corridors may be occupied by one or more rights-of-way with capability of accommodating additional rights-of-way. Planning corridors are unoccupied corridors identified as critical for future access to energy resource locations and transmission between generation sites and load centers.

### DISCUSSION OF ALTERNATIVES

The specific objectives and actions necessary for implementing each of the alternatives, by issue and resource, are shown in Table 2-1. The narrative following the table is intended to clarify the action statements. Where further clarification was not necessary, no narrative was prepared. The narrative also includes a discussion of appropriate mitigation which would be adopted as part of the actions.

BLM has identified the Balanced Use Alternative as it's preferred alternative. This alternative would be selected and implemented unless additional significant impacts or other new factors are identified through the review process. Along with the Balanced Use Alternative, BLM proposes to manage livestock grazing for an interim period of at least five years in a manner as described under the "No Action" Alternative. This would follow current BLM grazing policy to provide additional monitoring of forage conditions and trend prior to implementing increases or reductions in livestock use.

### Current Management Alternative

#### Leaseable Minerals

**Oil and Gas.** Land for oil and gas development would continue to be leased under the existing oil and gas category system (Appendix 4: Specialized Mineral Terminology). The Resource Area is divided into four categories. Category 1 areas are leased under standard oil and gas stipulations, Category 2 areas have special mitigation developed to protect critical resource values which cannot be adequately protected through the standard stipulations. Surface occupancy is not allowed on Category 3 areas, and Category 4 areas are not leased.

Resource values totaling 186,000 acres and requiring special mitigation for protection (Category 2) would include: critical antelope, deer, elk, and wild horse range, sage grouse leks, and severe winter condition areas. Also included are perennial streams, floodplains and wetlands, springs and seeps, and the scenic corridor along U.S. Highway 40.

Surface occupancy would not be allowed on 32,000 acres (Category 3) in order to protect: public water reserves, Boulevard Ridge watershed study area, the White River, portions of the Green River, lands adjacent to Dinosaur National Monument, inventoried recreation sites, the Book Cliffs Natural Area, and significant archaeological sites.



## CHAP. 2 - DESCRIPTIONS AND COMPARISONS OF ALTERNATIVES

TABLE 2-1  
Objectives and Actions of the Alternatives

Current Management	Resource Protection	Commodity Production	Preferred Alternative Balanced Use
MINERALS			
<u>Objective:</u> Oil and gas and gilson- ite would continue to be leased while other resource values would be protected or im- pacts mitigated. Sand, gravel, and building stone would continue to be provided to meet demand.	<u>Objective:</u> Lease minerals where no significant con- flicts exist with other resource values.  Renewable resource values would receive preference in land use decisions.	<u>Objective:</u> Mineral resource values would receive preference in making land use decisions. Provide sand, gravel and building stone to meet demand.	<u>Objective:</u> Oil and gas, tar sands, oil shale, and gilson- ite would be leased while other resource values would be pro- tected or mitigated. Sand, gravel and building stone would be provided where compat- ible with other resource uses.
<u>Actions:</u> Approximately 793,000 acres would be avail- able for lease for oil and gas under standard stipulations (Category 1), 186,000 acres would be available for lease with special stipulations (Category 2), 32,000 acres would be precluded from sur- face occupancy (Cate- gory 3), and 16,000 acres would not be leased (Category 4).	<u>Actions:</u> Approximately 489,000 acres could be avail- able for lease for oil and gas under standard stipulations (Category 1). Approximately 479,000 acres could be available for lease using special stipula- tions (Category 2). Surface occupancy would be precluded from 51,000 acres (Category 3). Leases would not be issued on 8,000 acres (Category 4).	<u>Actions:</u> Approximately 989,000 acres would be available for oil and gas lease using standard stipula- tions (Category 1). Approximately 35,000 acres would be available for lease using special mitigation (Category 2). Surface occupancy would be precluded on less than 3,000 acres (Cat- egory 3). No lands would be closed to leasing (Category 4).	<u>Actions:</u> Approximately 605,000 acres would be available for oil and gas lease using standard stipula- tions (Category 1). Approximately 413,000 acres would be available for lease using special mitigation (Category 2). Surface occupancy would be precluded on 9,000 acres (Category 3). No lands would be closed to leasing (Category 4).



## CHAP. 2 - DESCRIPTIONS AND COMPARISONS OF ALTERNATIVES

Current Management	Resource Protection	Commodity Production	Preferred Alternative Balanced Use
Land would be leased for gilsonite except along the Green and White Rivers.	Land would be leased for gilsonite subject to special mitigation developed under this alternative. The special mitigation would be derived from the oil and gas category system.	Land would be leased for gilsonite subject to special mitigation developed under this alternative. The special mitigation would be derived from the oil and gas category system.	Land would be leased for gilsonite subject to special mitigation developed under this alternative. The special mitigation would be derived from the oil and gas category system.
No additional oil shale leasing would occur. Federal oil shale tracts U-a and U-b would continue to be leased under all alternatives.	Priority management areas totalling approximately 18,000 acres would be available for underground mining. Two tracts consisting of a total of approximately 10,500 acres could be leased within this area after completion of the RMP. No areas would be available for in-situ development.	Priority management areas totalling approximately 84,000 acres for underground mining and 14,000 acres for in-situ development would be available for lease. Four tracts consisting of a total of approximately 21,000 acres could be located within these areas after completion of the RMP.	Priority management areas totalling approximately 42,000 acres for underground mining and 6,000 acres for in-situ development would be available for lease. Two to four tracts consisting of a total of approximately 10,500 to 21,000 acres could be leased within these areas after implementation of the RMP.



## CHAP. 2 - DESCRIPTIONS AND COMPARISONS OF ALTERNATIVES

Current Management	Resource Protection	Commodity Production	Preferred Alternative Balanced Use
No leases would be issued for tar sand development.	Combined hydrocarbon leases (competitive and conversion) would be issued subject to stipulations indicated in this document. Approximately 19,000 acres would be available for tar sand development using standard stipulations. Approximately 116,000 would require special mitigation. Surface occupancy would be precluded from 70,000 acres. Leases would not be issued on 12,000 acres within the Naval Oil Shale Reserve.	Combined hydrocarbon leases (competitive and conversion) would be issued subject to stipulations indicated in this document. Approximately 201,000 acres would be available for tar sand development using standard stipulations and an additional 4,000 acres using special mitigation. No areas would be precluded from surface occupancy. Leases would not be issued on 12,000 acres within the Naval Oil Shale Reserve.	Combined hydrocarbon leases (competitive and conversion) would be issued subject to stipulations indicated in this document. Approximately 110,000 acres would be available for tar sand development using standard stipulations. Approximately 68,000 acres would be available for development using special mitigation. Approximately 27,000 acres would be precluded from surface occupancy. Leases would not be issued on 12,000 acres within the Naval Oil Shale Reserve.
A schedule for a competitive lease program would be developed when demand warrants it.	A schedule for a competitive lease program would be developed when demand warrants it.	A schedule for a competitive lease program would be developed when demand warrants it.	A schedule for a competitive lease program would be developed when demand warrants it.
Sand and gravel material sites along the Green River and south of Blue Mountain could be established on a case-by-case basis. Approximately 160 acres would be available for community or free use.	Sand and gravel would not be sold. Current community and free use areas would be closed when permits expire.	Approximately 12,500 acres would be designated as potential sand and gravel material locations. Community and free use areas would be maintained in their current locations.	Approximately 8,500 acres of land would be designated as potential sand and gravel material sites. The community pit and free use areas would be retained in their present locations.



## CHAP. 2 - DESCRIPTIONS AND COMPARISONS OF ALTERNATIVES

Current Management	Resource Protection	Commodity Production	Preferred Alternative Balanced Use
Stone would continue to be sold from three collection areas totalling 21,500 acres.	Collection areas would be eliminated.	The Nutters Hole collection area would be enlarged to include an additional 24,500 acres. Disposals would continue from Johnson Draw and Buck Canyon areas for a total of 46,000 acres.	Approximately 21,500 acres would be designated as collection areas.
Approximately 25 percent of Federal lands would remain open to entry under provisions of the Mining Law of 1872, as amended. The remaining lands are under protective withdrawal and would not be open to entry.	Approximately 25 percent of Federal lands would remain open to entry under provisions of the Mining Law of 1872, as amended. The remaining lands are under protective withdrawal and would not be open to entry.	Approximately 25 percent of Federal lands would remain open to entry under provisions of the Mining Law of 1872, as amended. The remaining lands are under protective withdrawal and would not be open to entry.	Approximately 25 percent of Federal lands would remain open to entry under provisions of the Mining Law of 1872, as amended. The remaining lands are under protective withdrawal and would not be open to entry.



## CHAP. 2 - DESCRIPTIONS AND COMPARISONS OF ALTERNATIVES

Preferred Alternative		Balanced Use	
Current Management	Resource Protection	Commodity Production	
RIGHT-OF-WAY CORRIDORS			
<p><u>Objective:</u></p> <p>Rights-of-way would be issued on a case-by-case basis while providing protection of other resource values. The location of rights-of-way would be encouraged within identified corridors, or adjacent to existing rights-of-way.</p>	<p><u>Objective:</u></p> <p>Rights-of-way would be restricted to designated corridors to the maximum extent practical. Renewable resource values would receive preferential consideration in locating additional rights-of-way and corridors.</p>	<p><u>Objective:</u></p> <p>The development of resources would be facilitated through development of a network to allow maximum flexibility in establishing rights-of-way and corridors. Additional corridors could be established in response to future rights-of-way applications. Resources producing the greatest revenue and providing for human needs would receive preference in locating corridors and rights-of-way.</p>	<p><u>Objective:</u></p> <p>Rights-of-way would be encouraged within identified corridors while protecting or mitigating other resource values. Additional corridors could be established if compatible with other resource uses.</p>
<p><u>Actions:</u></p> <p>Approximately 170 miles of corridors consisting of 61,500 acres previously identified in Management Framework Plans (MFP) and MFP amendments would be designated. Exclusion areas would not be identified.</p>	<p><u>Actions:</u></p> <p>Approximately 150 miles of corridors consisting of 46,000 acres would be designated. No rights-of-way would be allowed in exclusion areas. Approximately 23,000 acres of land would be designated as exclusion areas.</p>	<p><u>Actions:</u></p> <p>Approximately 330 miles of corridors consisting of 174,000 acres would be designated. Exclusion areas would not be identified.</p>	<p><u>Actions:</u></p> <p>Approximately 235 miles of corridors consisting of 93,000 acres would be designated. Rights-of-way and corridors could be allowed in exclusion areas only if adequate mitigation, reclamation, or habitat enhancement could be accomplished. Approximately 23,000 acres of land would be designated as exclusion areas.</p>



## CHAP. 2 - DESCRIPTIONS AND COMPARISONS OF ALTERNATIVES

Current Management	Resource Protection	Commodity Production	Preferred Alternative Balanced Use
FORAGE			
<u>Objective:</u>	<u>Objective:</u>	<u>Objective:</u>	<u>Objective:</u>
Manage forage to: A. Maintain current stocking levels and grazing practices.	Manage forage for: A. Livestock numbers which allow fair and poor ecological condition areas to improve to good or excellent.	Manage forage to: A. Support full live-stock grazing preference* where potential exists for improvement.	Manage forage for: A. The average live-stock use (of three representative years from 1975 to 1982).
B. Maintain current level and trend of wildlife numbers.	B. Prior stable wildlife numbers.	B. Maintain present or reduced wildlife numbers.	B. Optimum wildlife numbers where not conflicting with the average livestock use and desired wild horse numbers.
C. Maintain present wild horse numbers.	C. Maintenance of desired wild horse numbers for Bonanza and Hill Creek herds and eliminate the wild horse herd at Winter Ridge.	C. Reduce wild horse numbers at Hill Creek and eliminate wild horse herds at Winter Ridge and Bonanza.	C. Desired wild horse numbers at Hill Creek only.
Maintain existing forage and livestock facilities.	Maintain or improve the existing forage resource through range management techniques and restrictions on livestock grazing.	Improve and increase forage through range management techniques.	Maintain or improve the total forage resource using management techniques which are compatible with use and development of other resources.

\* (Full livestock grazing preference is active grazing preference plus suspended nonuse.)



Current Management		Resource Protection		Commodity Production		Preferred Alternative Balanced Use	
<u>Actions:</u>		<u>Actions:</u>		<u>Actions:</u>		<u>Actions:</u>	
The following AUMs would be authorized.		The following AUMs would be authorized.		The following AUMs would be authorized.		The following AUMs would be authorized.	
A. Blue Mountain Locality Livestock	A. Blue Mountain Locality Livestock	A. Blue Mountain Locality Livestock	A. Blue Mountain Locality Livestock	A. Blue Mountain Locality Livestock	A. Blue Mountain Locality Livestock	A. Blue Mountain Locality Livestock	A. Blue Mountain Locality Livestock
Average Use 5,835 AUMs	Average Use 5,835 AUMs	Average Use 5,835 AUMs	Average Use 5,835 AUMs	Average Use 5,835 AUMs	Average Use 5,835 AUMs	Average Use 5,835 AUMs	Average Use 5,835 AUMs
Active Pref. 5,787 AUMs	Active Pref. 5,787 AUMs	Active Pref. 5,787 AUMs	Active Pref. 5,787 AUMs	Active Pref. 5,787 AUMs	Active Pref. 5,787 AUMs	Active Pref. 5,787 AUMs	Active Pref. 5,787 AUMs
Wildlife	Wildlife	Wildlife	Wildlife	Wildlife	Wildlife	Wildlife	Wildlife
Average Use 1,768 AUMs	Average Use 1,768 AUMs	Average Use 1,768 AUMs	Average Use 1,768 AUMs	Average Use 1,768 AUMs	Average Use 1,768 AUMs	Average Use 1,768 AUMs	Average Use 1,768 AUMs
Allocated Use 1,000 AUMs	Allocated Use 1,000 AUMs	Allocated Use 1,000 AUMs	Allocated Use 1,000 AUMs	Allocated Use 1,000 AUMs	Allocated Use 1,000 AUMs	Allocated Use 1,000 AUMs	Allocated Use 1,000 AUMs
B. Bonanza-Rainbow Locality Livestock	B. Bonanza-Rainbow Locality Livestock	B. Bonanza-Rainbow Locality Livestock	B. Bonanza-Rainbow Locality Livestock	B. Bonanza-Rainbow Locality Livestock	B. Bonanza-Rainbow Locality Livestock	B. Bonanza-Rainbow Locality Livestock	B. Bonanza-Rainbow Locality Livestock
Average Use 37,352 AUMs	Average Use 37,352 AUMs	Average Use 37,352 AUMs	Average Use 37,352 AUMs	Average Use 37,352 AUMs	Average Use 37,352 AUMs	Average Use 37,352 AUMs	Average Use 37,352 AUMs
Active Pref. 61,323 AUMs	Active Pref. 61,323 AUMs	Active Pref. 61,323 AUMs	Active Pref. 61,323 AUMs	Active Pref. 61,323 AUMs	Active Pref. 61,323 AUMs	Active Pref. 61,323 AUMs	Active Pref. 61,323 AUMs
Wildlife	Wildlife	Wildlife	Wildlife	Wildlife	Wildlife	Wildlife	Wildlife
Antelope Average Use 762 AUMs	Antelope Average Use 762 AUMs	Antelope Average Use 762 AUMs	Antelope Average Use 762 AUMs	Antelope Average Use 762 AUMs	Antelope Average Use 762 AUMs	Antelope Average Use 762 AUMs	Antelope Average Use 762 AUMs
Antelope Allocated Use 312 AUMs	Antelope Allocated Use 312 AUMs	Antelope Allocated Use 312 AUMs	Antelope Allocated Use 312 AUMs	Antelope Allocated Use 312 AUMs	Antelope Allocated Use 312 AUMs	Antelope Allocated Use 312 AUMs	Antelope Allocated Use 312 AUMs
*Deer Average Use a AUMs	*Deer Average Use a AUMs	*Deer Average Use b AUMs	*Deer Average Use b AUMs	*Deer Average Use c AUMs	*Deer Average Use c AUMs	*Deer Average Use d AUMs	*Deer Average Use d AUMs
Deer Allocated Use 2,959 AUMs	Deer Allocated Use 2,959 AUMs	Deer Allocated Use 2,959 AUMs	Deer Allocated Use 2,959 AUMs	Deer Allocated Use 2,959 AUMs	Deer Allocated Use 2,959 AUMs	Deer Allocated Use 2,959 AUMs	Deer Allocated Use 2,959 AUMs
Wild horses	Wild horses	Wild horses	Wild horses	Wild horses	Wild horses	Wild horses	Wild horses
Average Use 480 AUMs	Average Use 480 AUMs	Average Use 480 AUMs	Average Use 480 AUMs	Average Use 480 AUMs	Average Use 480 AUMs	Average Use 480 AUMs	Average Use 480 AUMs
Allocated Use 0 AUMs	Allocated Use 0 AUMs	Allocated Use 0 AUMs	Allocated Use 0 AUMs	Allocated Use 0 AUMs	Allocated Use 0 AUMs	Allocated Use 0 AUMs	Allocated Use 0 AUMs



Current Management		Resource Protection		Commodity Production		Preferred Alternative
						Balanced Use
C. Book Cliffs Locality		C. Book Cliffs Locality		C. Book Cliffs Locality		C. Book Cliffs Locality
Livestock	17,351 AUMs	Livestock	15,412 AUMs	Livestock	28,385 AUMs	Livestock 17,351 AUMs
Average Use	23,174 AUMs					
Active Pref.	a&e AUMs					
Wildlife		**Wildlife b&f	AUMs	**Wildlife c&g	AUMs	**Wildlife d&h AUMs
**Average Use	38,867 AUMs					
Allocated Use	108 AUMs	Wild horses	0 AUMs	Wild horses	0 AUMs	Wild horses 0 AUMs
Wild horses	0 AUMs					
Average Use						
Allocated Use						
D. Hill Creek Locality		D. Hill Creek Locality		D. Hill Creek Locality		D. Hill Creek Locality
Livestock	6,442 AUMs	Livestock	5,045 AUMs	Livestock	12,649 AUMs	Livestock 6,440 AUMs
Average Use	12,631 AUMs					
Active Pref.	a&e AUMs					
Wildlife		**Wildlife b&f	AUMs	**Wildlife c&g	AUMs	**Wildlife d&h AUMs
**Average Use	500 AUMs					
Allocated Use	1,881 AUMs	Wild horses	2,340 AUMs	Wild horses	710 AUMs	Wild horses 2,340 AUMs
Wild horses	0 AUMs					
Average Use						
Allocated Use						
Totals						
Livestock	66,980 AUMs	Livestock	53,373 AUMs	Livestock	109,485 AUMs	Livestock 66,887 AUMs
Average Use	102,915 AUMs					
Active Pref.						
Wildlife	18,506 AUMs	Wildlife	55,597 AUMs	Wildlife	17,287 AUMs	Wildlife 47,596 AUMs
Average Use	43,638 AUMs					
Allocated Use		Wild horses	2,940 AUMs	Wild horses	710 AUMs	Wild horses 2,340 AUMs
Wild horses	2,469 AUMs					
Average Use	0 AUMs					
Allocated Use						

# LEGEND

\*Deer herd unit 28A contains all of the land area included within the Bonanza-Rainbow, Book Cliffs, and Hill Creek localities. Data are not available to allocate the deer use on a locality basis, hence the proposed deer use is presented for each alternative by herd unit only. Each locality would receive an unknown percentage of the total herd use. BLM observations indicate that deer use would be heaviest in the Book Cliff locality and lightest in the Hill Creek locality.



Current Management		Resource Protection	Commodity Production	Preferred Alternative	
				Balanced Use	
<sup>a</sup> Unknown part of deer herd unit 28A Average Herd Use = 12,784 AUMs		<sup>b</sup> Unknown part of deer herd unit 28A Proposed Herd Use = 37,113 AUMs	<sup>c</sup> Unknown part of deer herd unit 28A Proposed Herd Use = 12,784 AUMs	<sup>d</sup> Unknown part of deer herd unit 28A Proposed Herd Use = 32,577 AUMs	
<p>**Elk herd unit 21 contains all of the land area included within the Book Cliffs and Hill Creek localities. Data are not available to allocate the elk use on a locality basis, hence the proposed elk use is presented for each alternative by herd unit only. Each locality would receive an unknown percentage of the total herd use. BLM observations indicate that elk use would be heaviest in the Book Cliff locality and lightest in the Hill Creek locality.</p>					
<sup>e</sup> Unknown part of elk herd unit 21 Average Herd Use = 3,192 AUMs		<sup>f</sup> Unknown part of elk herd unit 21 Proposed Herd Use = 14,681 AUMs	<sup>g</sup> Unknown part of elk herd unit 21 Proposed Herd Use = 3,192 AUMs	<sup>h</sup> Unknown part of elk herd unit 21 Proposed Herd Use = 12,128 AUMs	



## CHAP. 2 - DESCRIPTIONS AND COMPARISONS OF ALTERNATIVES

Current Management	Resource Protection	Commodity Production	Preferred Alternative Balanced Use
No new land treatments would be developed for livestock.	Approximately 15,000 acres would be pre-scribe burned to improve forage, and an additional 600 acres clear cut, resulting in an increase of 1,700 AUMs.	Approximately 13,000 acres would be pre-scribe burned, 15,500 acres chemically treated or burned, and 1,700 acres chained or clear cut to improve forage, resulting in an increase of approximately 2,700 livestock AUMs.	Approximately 8,050 acres would be pre-scribe burned, 10,900 acres chemically treated or burned, and 300 acres of pinyon juniper clear cut to improve wildlife and livestock forage, resulting in an increase of approximately 2,000 AUMs.
Season of use would not change.	Spring livestock grazing would be eliminated or restricted through grazing systems or livestock decreases on 50 allotments.	Season of use would be changed in connection with grazing systems on approximately 13 allotments.	Spring grazing would be eliminated or restricted through grazing systems. on approximately 15 allotments.
No new water projects would be developed for livestock.	Approximately 31 reservoirs, 14 sheeps and springs, 6 guzzlers and 3 miles of pipeline would be developed for livestock. Water rights would be acquired from the State of Utah for all water projects.	Approximately 62 reservoirs, 16 sheeps and springs, and 21 guzzlers and 4 miles of pipeline would be developed for livestock. Water rights would be acquired from the State of Utah for all water projects.	Approximately 64 reservoirs, 20 sheeps or springs, 32 guzzlers and 3 miles of pipeline would be developed for livestock. Water rights would be acquired from the State of Utah for all water projects.
No new fences would be built.	Approximately 10 miles of new fence would be built. (Approximately 5 miles of this fence would be built and maintained by BIM to protect critical floodplains).	Approximately 18 miles of new fence would be built.	Approximately 18 miles of new fence would be built.



## CHAP. 2 - DESCRIPTIONS AND COMPARISONS OF ALTERNATIVES

Current Management	Resource Protection	Commodity Production	Preferred Alternative Balanced Use
Floodplains would be protected as required by Executive Order 11988, but no floodplains would be improved.	Livestock would be limited or restricted from 5,950 acres of floodplains to improve these sites.	Floodplains would be protected as required by Executive Order 11988, but no floodplains would be improved.	Livestock would be limited or restricted from 470 acres of floodplain to improve these sites.
Livestock would not be excluded from wildlife habitat.	Livestock would be limited from 14,000 acres of deer and elk crucial winter habitat on McCook Ridge (751 AUMs). A reduction of 2,110 livestock AUMs would provide additional wildlife forage for deer herd 26, Blue Mountain.	Livestock would not be excluded from wildlife habitat.	Livestock would not be excluded from wildlife habitat.
Continue management on 13 current AMPs. No new AMPs would be developed.	Continue current management of 3 AMPs, evaluate and revise 10 AMPs to incorporate changes in season of use, livestock limitations or restrictions, wild horse use levels and mineral development. Develop no new AMPs.	Continue current management on 6 AMPs, evaluate and revise 7 AMPs, develop new AMPs on 11 allotments.	Continue current management on 6 AMPs, evaluate and revise 7 AMPs and develop new AMPs on 11 allotments.



## CHAP. 2 - DESCRIPTIONS AND COMPARISONS OF ALTERNATIVES

Current Management	Resource Protection	Commodity Production	Preferred Alternative Balanced Use
WILDLIFE AND WILDHORSES			
<u>Objective:</u> Wildlife habitats would continue to be managed to maintain wildlife populations at their current, yet increasing, trend. Wildhorse habitat would be managed to maintain current wildhorse populations.	<u>Objective:</u> Wildlife habitats would be managed at prior-stable wildlife population levels. Wildhorse habitat would be managed to support desired wildhorse population levels at two herd locations.	<u>Objective:</u> Wildlife habitats would be managed to sustain wildlife populations near or at current levels. Wildhorse habitat would be managed, at reduced wildhorse population levels, at one herd location, eliminating two herds.	<u>Objective:</u> Wildlife habitats would be managed for optimum wildlife levels where conflicts with livestock do not exist. Wildhorse habitat would be managed to support desired population levels at one herd location, eliminating two herds.
<u>Actions:</u> Provide forage to support 7,700 mule deer, 500 elk, 611 antelope, and 206 wild horses.  A total of 18,506 AUMs would be utilized by big game and 2,469 AUMs by wild horses.	<u>Actions:</u> Provide forage to support 19,800 mule deer, 2,300 elk, 1,114 antelope and 245 wild horses.  A total of 55,597 AUMs would be utilized by big game and 2,940 AUMs by wild horses.	<u>Actions:</u> Provide forage to support approximately 7,300 mule deer, 500 elk, 302 antelope, and 60 wild horses.  A total of 17,287 AUMs would be utilized by big game and 710 AUMs by wild horses.	<u>Actions:</u> Provide forage to support approximately 17,300 deer, 1,900 elk, 900 antelope, and 195 wild horses.  Approximately 47,596 AUMs would be utilized by big game and 2,340 AUMs by wild horses.



## CHAP. 2 - DESCRIPTIONS AND COMPARISONS OF ALTERNATIVES

Current Management	Resource Protection	Commodity Production	Preferred Alternative Balanced Use
Habitat for deer herd unit 26 (Blue Mountain) would be managed to support current levels. Habitat for deer herd unit 28A (Book Cliffs) would be managed to support increasing levels.	Habitat for deer herd unit 26 (Blue Mountain) would be managed to support slightly increased levels. Habitat for deer herd unit 28A (Book Cliffs) would be managed to support prior-stable levels.	Habitat for deer herd unit 26 (Blue Mountain) would be managed to support a significantly reduced level. Habitat for deer herd unit 28A (Book Cliffs) would be managed to support current levels.	Habitat for deer herd unit 26 (Blue Mountain) would be managed to support current levels. Habitat for deer herd unit 28A (Book Cliffs) would be managed to support significantly increased levels.
Antelope habitat would be managed to support slowly increasing levels at both the Bonanza and East Bench herd locations.	Antelope habitat would be managed to support objective (prior-stable) levels at both the Bonanza and East Bench herd locations.	Antelope habitat would be managed to support the current level at the East Bench herd location, and at a reduced level at the Bonanza location.	Antelope habitat would be managed to support increased levels at both the Bonanza and East Bench herd locations.
Approximately 5,000 to 10,000 acres of browse would be burned, but no acreage of pinyon/juniper chained or clearcut. Approximately 10 to 30 water projects would be developed for wildlife over the next decade.	Approximately 15,000 acres of browse would be burned, and 1,000 acres of pinyon/juniper chained or clearcut. Approximately 70 to 150 water projects would be developed for wildlife over the next decade.	No habitat would be burned or chained for wildlife. Approximately 1 to 20 water projects would be developed for wildlife over the next decade.	Approximately 9,000 acres of browse would be burned, and 2,000 acres of pinyon/juniper chained or clearcut. Approximately 50 to 100 water projects would be developed for wildlife over the next decade.
No habitat management plans (HMPs) would be developed.	Four HMPs would be prepared.	Four HMPs would be prepared.	Four HMPs would be prepared.
No wild horse management plans would be developed.	Two wild horse management plans would be prepared.	One wild horse management plan would be prepared.	One wild horse management plan would be prepared.



## CHAP. 2 - DESCRIPTIONS AND COMPARISONS OF ALTERNATIVES

Current Management		Resource Protection	Commodity Production	Preferred Alternative Balanced Use
WOODLANDS				
<u>Objective:</u>	Provide woodland products to meet demand. Preserve forest species to benefit other resource values.	<u>Objective:</u>	<u>Objective:</u>	<u>Objective:</u>
		Provide woodland products on a sustained yield basis where compatible with protection of other resource values. Preserve forest species to benefit other resource values.	Maximize utilization of woodland products. Practice sustained yield on those areas where woodland management is determined to be the most economical use of the land.	Provide woodland products where minimal conflicts with other resources exist. Encourage utilization of woodland products from lands that would be converted to other resource uses.
<u>Actions:</u>	<u>Actions:</u>	<u>Actions:</u>	<u>Actions:</u>	<u>Actions:</u>
Approximately 35,300 acres of productive woodland would be available for harvest. Amount harvested would depend on demand.	Approximately 32,700 acres would be maintained on a sustained yield basis with an allowable cut of 3,470 cords/year.	Approximately 31,100 acres would be managed on a sustained yield basis with an allowable cut of 3,730 cords/year.	Approximately 39,600 acres would be managed on a sustained yield basis with an allowable cut of 4,270 cords/year.	
<u>Species</u>	<u>Species</u>	<u>Species</u>	<u>Species</u>	<u>Species</u>
Pinyon/juniper 35,300 Cottonwood 0 Douglas fir 0	Pinyon/juniper 32,700 Cottonwood 0 Douglas fir 0	Pinyon/juniper 26,800 Cottonwood 300 Douglas fir 4,000	Pinyon/juniper 37,300 Cottonwood 300 Douglas fir 2,000	



## CHAP. 2 - DESCRIPTIONS AND COMPARISONS OF ALTERNATIVES

Preferred Alternative		Balanced Use	
Current Management	Resource Protection	Commodity Production	
RECREATION			
<u>Objective:</u>	<u>Objective:</u>	<u>Objective:</u>	<u>Objective:</u>
Protect all currently identified recreation sites, scenic overlooks, travel corridors having recreational values, and recreational qualities of the river corridors while allowing continued ORV use without immediate designation.	Protect all currently identified recreation sites, scenic overlooks, travel corridors having recreational values, and scenic and recreational qualities of the river corridors by limiting or prohibiting ORV use.	Protect the highest quality recreation sites, scenic overlooks and portions of the Green River corridor where compatible with resource development. Allow open ORV use except where conflicts occur with resource development.	Protect the high quality recreation sites, overlooks and scenic corridors. Protect or mitigate recreational values of the Green and White River corridors. Designate as much land as possible open for ORV use while protecting areas where damage to resource values would occur.
<u>Actions:</u>	<u>Actions:</u>	<u>Actions:</u>	<u>Actions:</u>
No ORV designations would be made until 1987. RMP would be amended to accommodate ORV designation.	The following ORV designations would be made:  Open - 661,400 acres Limited-355,200 acres Closed - 63,400 acres  Continue protection of 15 campsites (895 acres), 6 scenic overlooks (730 acres), and 1 geologic feature (60 acres).	The following ORV designations would be made:  Open - 931,840 acres Limited-147,200 acres Closed - 960 acres  Continue protection of 4 camp sites (280 acres), 1 scenic overlook (320 acres), and 1 geologic feature (60 acres).	The following ORV designations would be made:  Open - 674,200 acres Limited-399,400 acres Closed - 6,400 acres  Continue protection of 5 camp sites (320 acres), 1 scenic overlook (320 acres), and 1 geologic feature (60 acres). Add protection of 1 new geologic feature (10 acres) and expand 1 existing scenic overlook by 160 acres.



## CHAP. 2 - DESCRIPTIONS AND COMPARISONS OF ALTERNATIVES

Current Management	Resource Protection	Commodity Production	Preferred Alternative Balanced Use
Maintain the Highway 40 scenic corridor (5,440 acres).	Expand the Highway 40 scenic travel corridor by 4,760 acres. Add 2 additional scenic travel corridors: Book Cliffs Divide (4,100 acres) and new Bonanza Highway (3,300 acres).	There would not be any scenic corridors.	Same as Resource Protection Alternative.
The White River Canyon would be protected excluding the approved dam and 2 utility corridors (5,250 acres).	Same as Current Management Alternative.	The White River Canyon would not be a recreation corridor.	Same as Current Management Alternative.
Segments of the Green River where development would be mitigated or not permitted as follows:	Same as Current Management Alternative.	Segments of the Green River where development would be mitigated or not permitted as follows:	Segments of the Green River where development would be mitigated or not permitted as follows:
Partially Protected - 5,250 Protected - 9,150	Partially Protected - 3,500 Protected - 10,900	Partially Protected - 12,500 Protected - 1,900	Partially Protected - 4,930 Protected - 9,470
The Book Cliffs Mountain Browse Natural Area would be managed to protect and maintain the vegetation in a natural condition.	Same as Current Management Alternative.	The natural area designation would be dropped and the area opened to livestock grazing and mineral development.	Same as Current Management Alternative.



## CHAP. 2 - DESCRIPTIONS AND COMPARISONS OF ALTERNATIVES

Current Management	Resource Protection	Commodity Production	Preferred Alternative Balanced Use
FIRE MANAGEMENT			
<u>Objective:</u> Extinguish all wildfires and utilize a limited prescribe burn program to benefit other re-sources.	<u>Objective:</u> Extinguish all wildfires where they conflict with other resource values. Allow other areas to burn where no conflicts exist.	<u>Objective:</u> Utilize all fire management techniques to maximize commodity production throughout the BCRA. Employ prescribe burning to benefit other resource values.	<u>Objective:</u> Utilize fire as a resource management tool, employing prescribe burning, modified and full suppression techniques. Resource trade-offs would be made.
<u>Actions:</u> Full suppression would be employed on 1,070,000 to 1,075,000 acres.  A modified suppression program would not be utilized.	<u>Actions:</u> Full suppression would be employed on 84,500 acres.  Modified suppression would be employed on 965,500 acres.	<u>Actions:</u> Full suppression would be employed on 84,500 acres.  Modified suppression would be employed on 967,000 to 982,500 acres.	<u>Actions:</u> Full suppression would be employed on 84,500 acres.  Modified suppression would be employed on 967,600 to 978,500 acres.



## CHAP. 2 - DESCRIPTIONS AND COMPARISONS OF ALTERNATIVES

Current Management	Resource Protection	Commodity Production	Preferred Alternative Balanced Use
WATERSHED			
<p><u>Objective:</u></p> <p>Protect floodplains, severe and critical erosion areas, the watershed study area, public water reserves, and water rights, water quality from adverse impacts through mitigation allowing development of other resources.</p>	<p><u>Objective:</u></p> <p>Protect floodplains, public water reserves, and water quality by restricting or eliminating critical surface disturbing activities in those areas. Protect the watershed study area. Mitigate adverse impacts to severe and critical erosion areas. Restore degraded water quality, floodplains, and severe and critical erosion areas.</p>	<p><u>Objective:</u></p> <p>Mitigate adverse impacts to floodplains, public water reserves, water quality and severe and critical erosion areas. Restore only those degraded areas that would improve forage and water production and not conflict with mineral development.</p>	<p><u>Objective:</u></p> <p>Protect floodplains, public water reserves, water quality, severe and critical erosion areas and the watershed study area by restricting or mitigating surface disturbance. Restore degraded areas compatible with other resource uses.</p>
<p><u>Actions:</u></p> <p>Maintain Boulevard Ridge Watershed Study Area.</p> <p>Implement watershed treatment measures on small areas up to a total of 10,000 acres.</p>	<p><u>Actions:</u></p> <p>Maintain Boulevard Ridge Watershed Study Area for 10 years.</p> <p>Implement watershed treatment measures on areas up to a total of 111,100 acres.</p>	<p><u>Actions:</u></p> <p>Discontinue Boulevard Ridge Watershed Study Area.</p> <p>Implement watershed treatment measures on small areas up to a total of 6,400 acres.</p>	<p><u>Actions:</u></p> <p>Maintain Boulevard Ridge Watershed Study Area as long as it serves a scientific purpose.</p> <p>Implement watershed treatment measures on areas up to a total of 78,900 acres.</p>



## CHAP. 2 - DESCRIPTIONS AND COMPARISONS OF ALTERNATIVES

Preferred Alternative		Balanced Use	
Current Management	Resource Protection	Commodity Production	
LAND TENURE ADJUSTMENTS			
<p><u>Objective:</u></p> <p>Land disposal actions would be considered on a case-by-case basis where such actions would not conflict with existing resource management programs. Exchanges and land acquisitions that would improve management opportunities for resource protection, resource development, or administration of public lands would be considered.</p> <p><u>Actions:</u></p> <p>Approximately 1,360 acres of land would be made available for disposal through exchange or sale.</p> <p>No land would be delineated for potential acquisition.</p>	<p><u>Objective:</u></p> <p>The land disposal program would be managed with overall emphasis on retention of public lands. Exchanges and land acquisitions would be considered that would provide protection of renewable resources.</p> <p><u>Actions:</u></p> <p>No land would be identified for disposal except through exchange.</p> <p>Approximately 5,660 acres of land (important wildlife habitat) would be acquired if opportunities become available.</p>	<p><u>Objective:</u></p> <p>Land would be made available for community, economic, and agricultural needs. Disposal of isolated tracts that are difficult to manage would be considered. Exchanges and land acquisitions that benefit development of oil shale and tar sand resources would be considered.</p> <p><u>Actions:</u></p> <p>Approximately 16,000 acres of land could be made available for disposal through exchange or sale.</p> <p>Approximately 10,000 acres of land would be acquired if opportunities become available.</p>	<p><u>Objective:</u></p> <p>Land disposals would be provided on a limited basis where community, economic, and agricultural needs outweigh retaining the land in public ownership. Exchanges and land acquisitions would be considered that would improve management opportunities for resource protection, or resource development, or administration of public lands.</p> <p><u>Actions:</u></p> <p>Approximately 570 acres of land would be made available for disposal through exchange or sale.</p> <p>Approximately 5,800 acres of land would be acquired for wildlife habitat and recreation management if opportunities become available.</p>



## CHAP. 2 - DESCRIPTIONS AND COMPARISONS OF ALTERNATIVES

The 16,000 acres of no lease land (Category 4) include: a few miles along the Green River, key recreation areas, scenic lands adjacent to Dinosaur National Monument, and oil shale tracts U-a and U-b, (Figure 2-1). The Naval Oil Shale Reserve and power site withdrawals (53,000 acres) are not available for lease under any alternative (Figure 1-4). All other lands are open for leasing under standard lease stipulations (Category 1).

Standard mitigating measures are contained in 43 CFR 3570. This information is commonly reported by the lessee in the 13 point surface use plan as part of every oil and gas lease. An 'on site' inspection is conducted in relation to the surface use plan to determine the most feasible and environmentally acceptable area for well sites, access roads, and other proposed surface use areas.

Special mitigating measures, such as seasonal restrictions, are listed in the wildlife, watershed, and recreation sections.

**Oil Shale.** Two Federal oil shale tracts, U-a and U-b, are currently being developed by the White River Shale Corporation (Figure 1-4). No additional Federal leasing of oil shale would be anticipated under this alternative. Companies such as Paraho, Syntanna, Tosco, Magic Circle, and Geokinetics, have oil shale ventures in the area on land leased through the State of Utah (BLM 1982).

**Tar Sand.** No development of tar sand deposits would be allowed. Leasing of combined hydrocarbons (tar sand), by either conversion application or competitive bidding, would not be approved even though conversion applications have been submitted (Figure 2-2).

### Salable Minerals

**Sand and Gravel.** New sites could be established along the southeast side of the Green River and south of Blue Mountain or in other locations on a case-by-case basis as the need arises (Figure 2-3). The community sand and gravel pit adjacent to the Green River would be retained in its current location. Disposals would continue in free use permit areas next to the Green River until supplies are depleted or permits expire.

**Building Stone.** Building stone would continue to be sold from the Buck Canyon, Johnson Draw, and Nutters Hole collecting areas (Figure 2-4).

### Right-of-Way Corridors

The proposed corridors for this alternative have been identified in Management Framework Plans (MFP) and MFP amendments and are shown in Figure 2-5.

A "right-of-way corridor" (or corridor) is a linear strip of land identified as having certain land use, environmental, engineering, and economic advantages for the present or future location of one or more transportation or utility rights-of-way. This designation could minimize or restrict to given areas the environmental impacts that result from

unplanned rights-of-way. A corridor is considered to be a "preferred" area for future rights-of-way; it does not preclude the area from other types of activities.

### Forage

Forage related actions for this alternative are outlined by allotment Appendix 5 (Forage Actions by Alternative) and are discussed as follows:

**Grazing Practices.** Stocking levels, seasons of use, the kind and class of livestock and grazing pattern (including 13 existing AMPs) would remain as are currently authorized. Requests for changes in any of the above items would be considered on a case-by-case basis. There would be no active program to develop new allotment management plans or grazing systems. No special practices or actions would be proposed for wild horses.

**Livestock Adjustments.** The current stocking level (average licensed use) would remain unchanged at approximately 66,980 AUMs. The active livestock preference is 102,915 AUMs. Under this alternative, the active preference would be used as the technical base for authorizing stocking levels. No reductions from active preference would be proposed. If active preference would be fully activated, it would result in an increase of 35,935 AUMs over the current stocking level. Individual operations would have the option of increasing or decreasing their level of active or nonuse. However, it is assumed that the overall level of nonuse would remain relatively constant.

Under current use, there would be no special provision to provide forage for wild horses. Wild horse forage would continue to be provided from livestock nonuse based on the assumption of a relatively constant nonuse level.

**Range Improvements.** No specific livestock projects are proposed under this alternative. Improvement work would be limited primarily to reconstruction, development of cooperative improvements, and improvements to remedy special need situations.

**Implementation Schedule.** The Current Management Alternative would be implemented as follows:

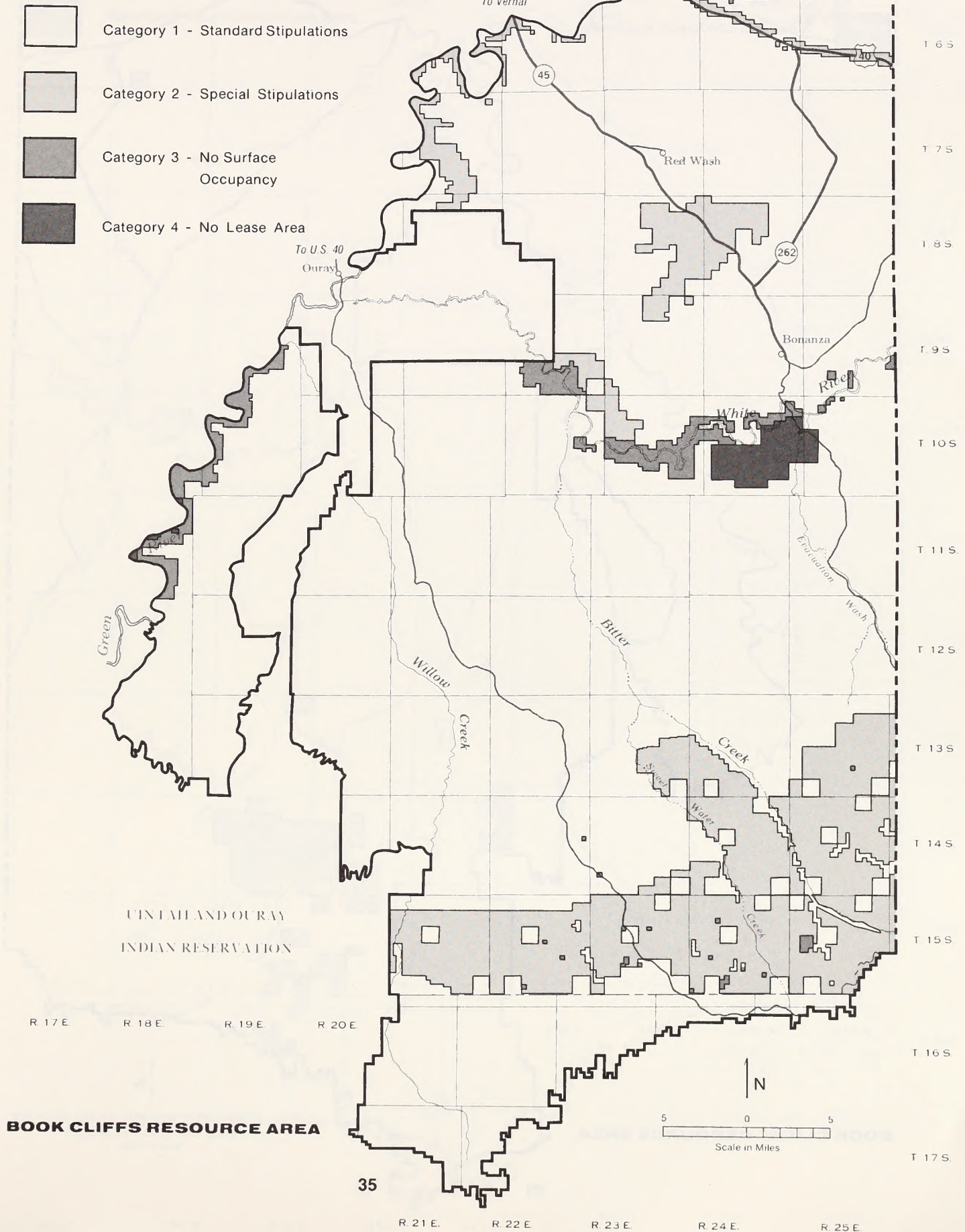
1. Begin the "5-year monitoring program" to determine any needed adjustments (livestock numbers, seasons of use, vegetative treatments).
2. Retain the current allotment management plans.
3. Maintain existing water facilities, fences, and land treatments.
4. Develop improvements to satisfy special needs.

**Riparian Habitat, Floodplains, and Crucial Wildlife Habitat.** Floodplains and riparian habitat would be protected as required by Executive Order 11988 by avoiding development in these areas or requiring minimization of damage through restoration and preservation measures.



# **OIL AND GAS LEASING CATEGORIES (CURRENT MANAGEMENT ALTERNATIVE)**

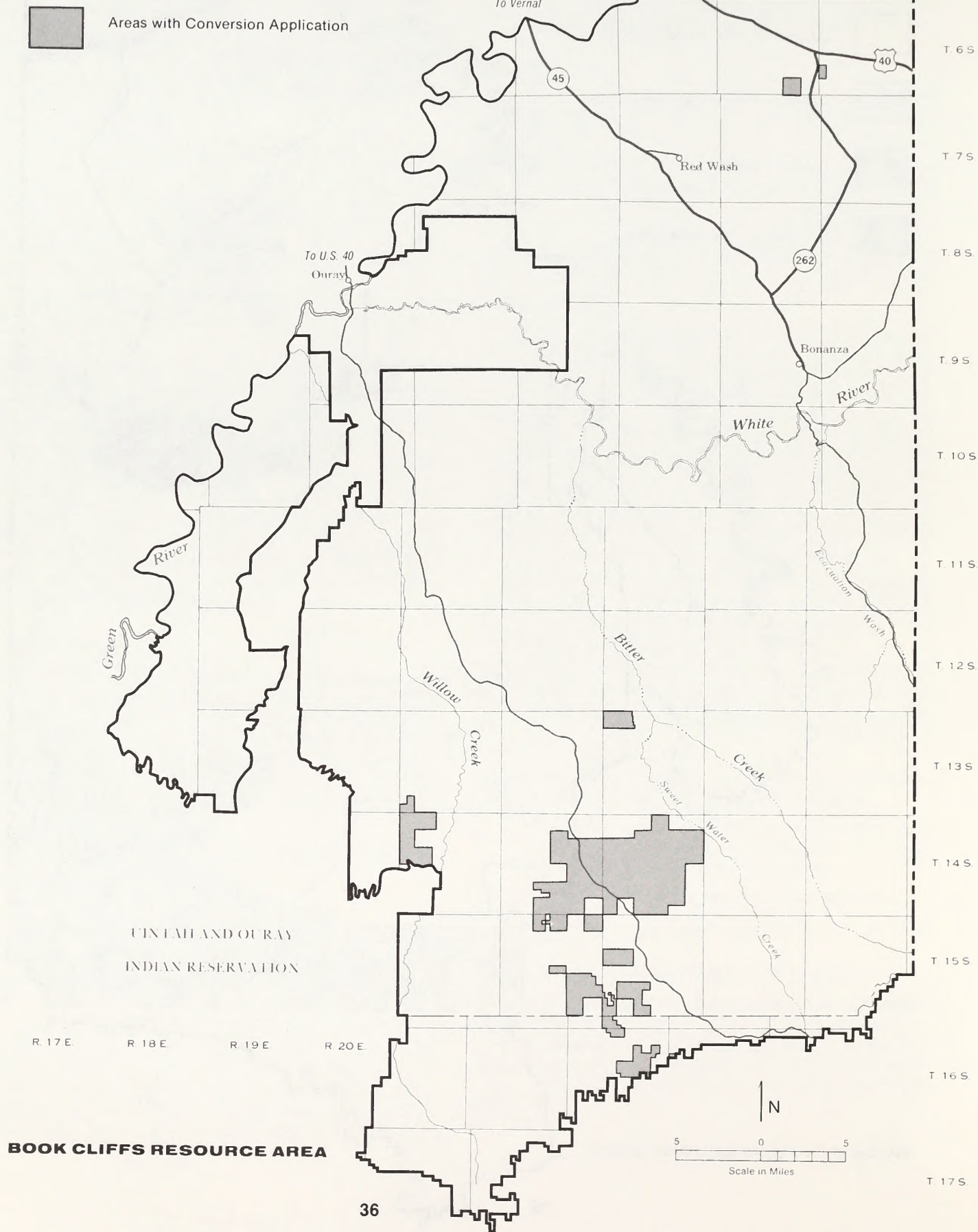
Figure 2 - 1





# AREAS WITH APPLICATION TO CONVERT EXISTING OIL AND GAS LEASES TO COMBINED HYDROCARBON LEASES

Figure 2 - 2



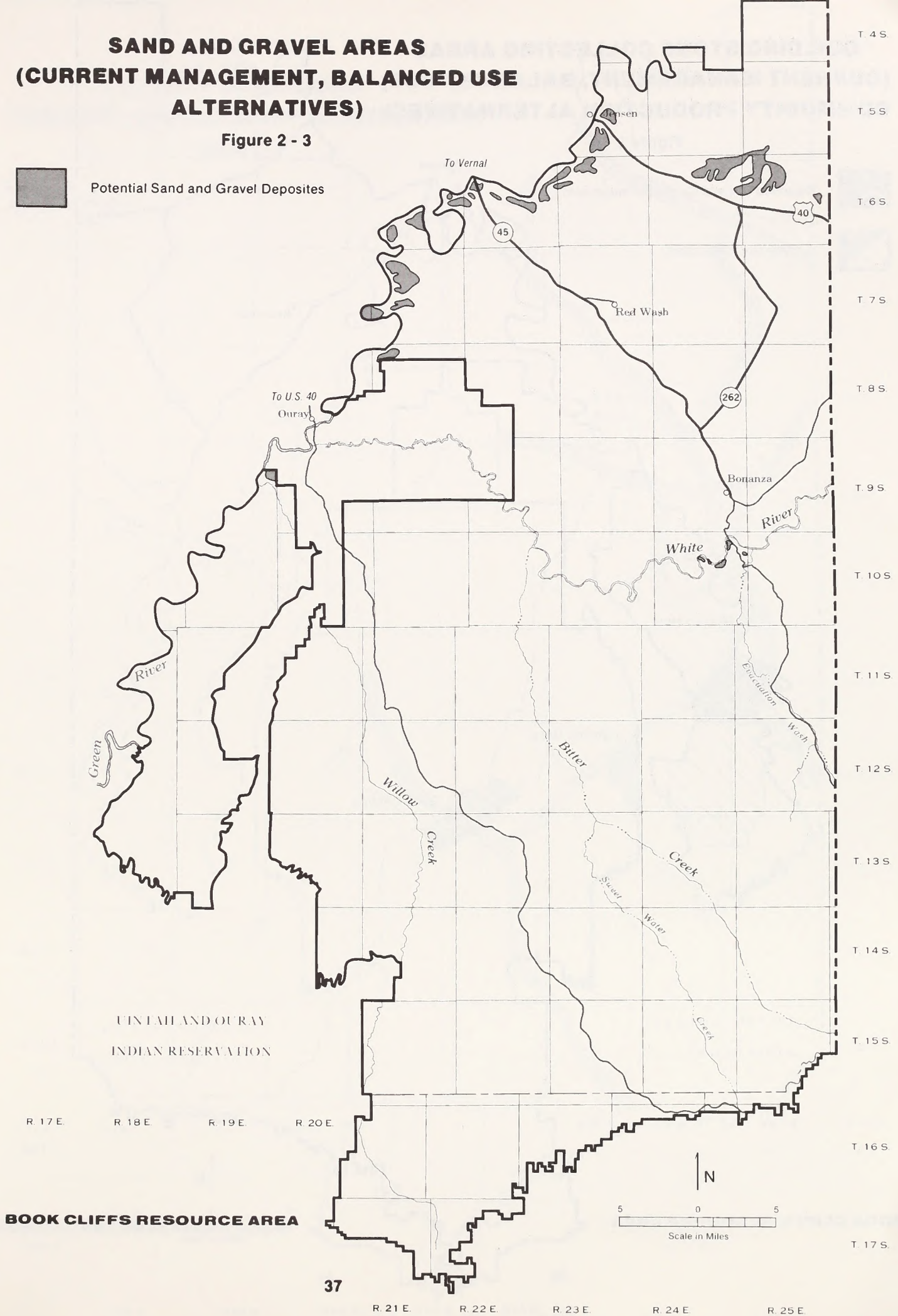


# **SAND AND GRAVEL AREAS (CURRENT MANAGEMENT, BALANCED USE ALTERNATIVES)**

**Figure 2 - 3**



Potential Sand and Gravel Deposits





# BUILDING STONE COLLECTING AREAS (CURRENT MANAGEMENT, BALANCED USE, COMMODITY PRODUCTION ALTERNATIVES)

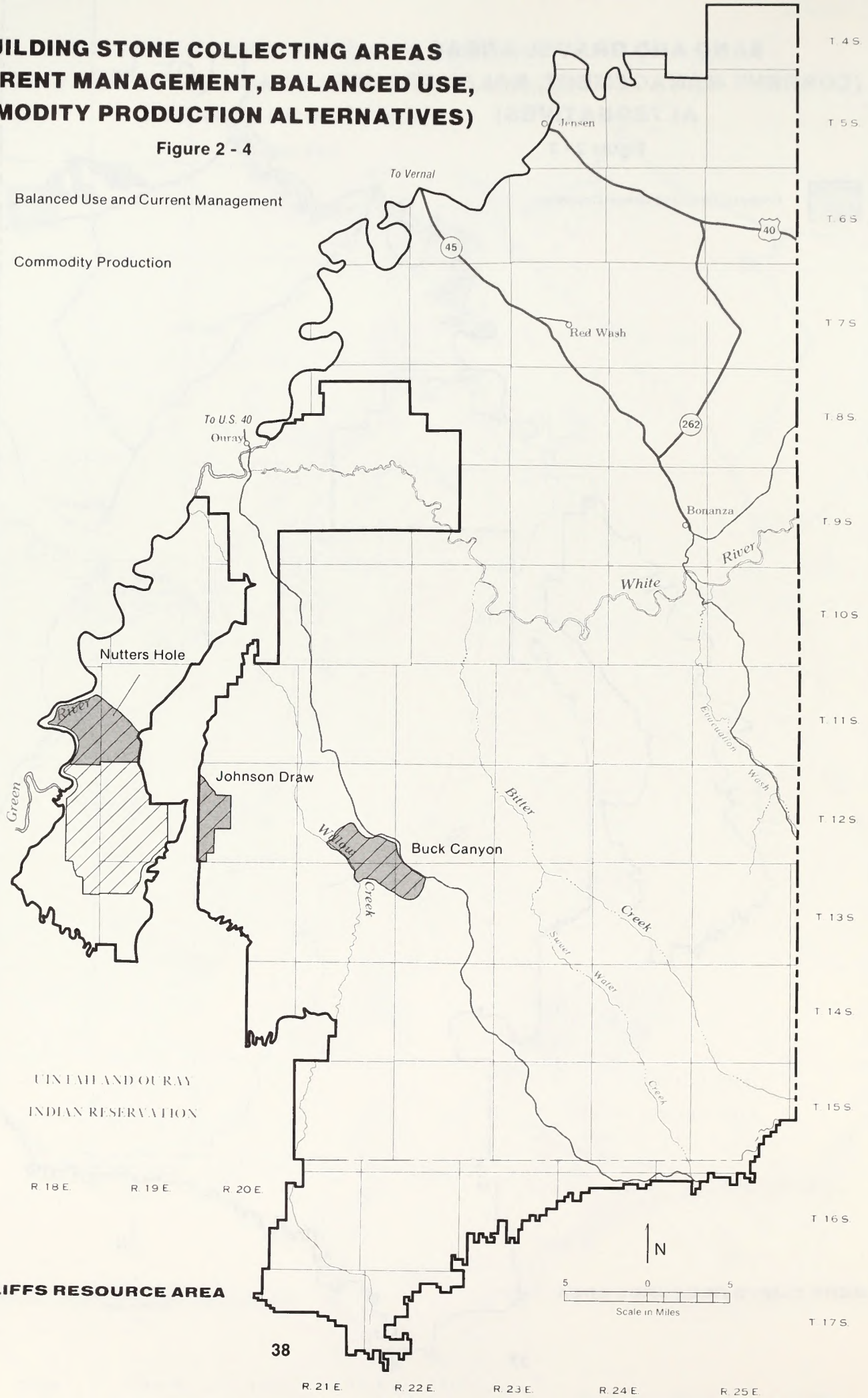
Figure 2 - 4



Balanced Use and Current Management



Commodity Production

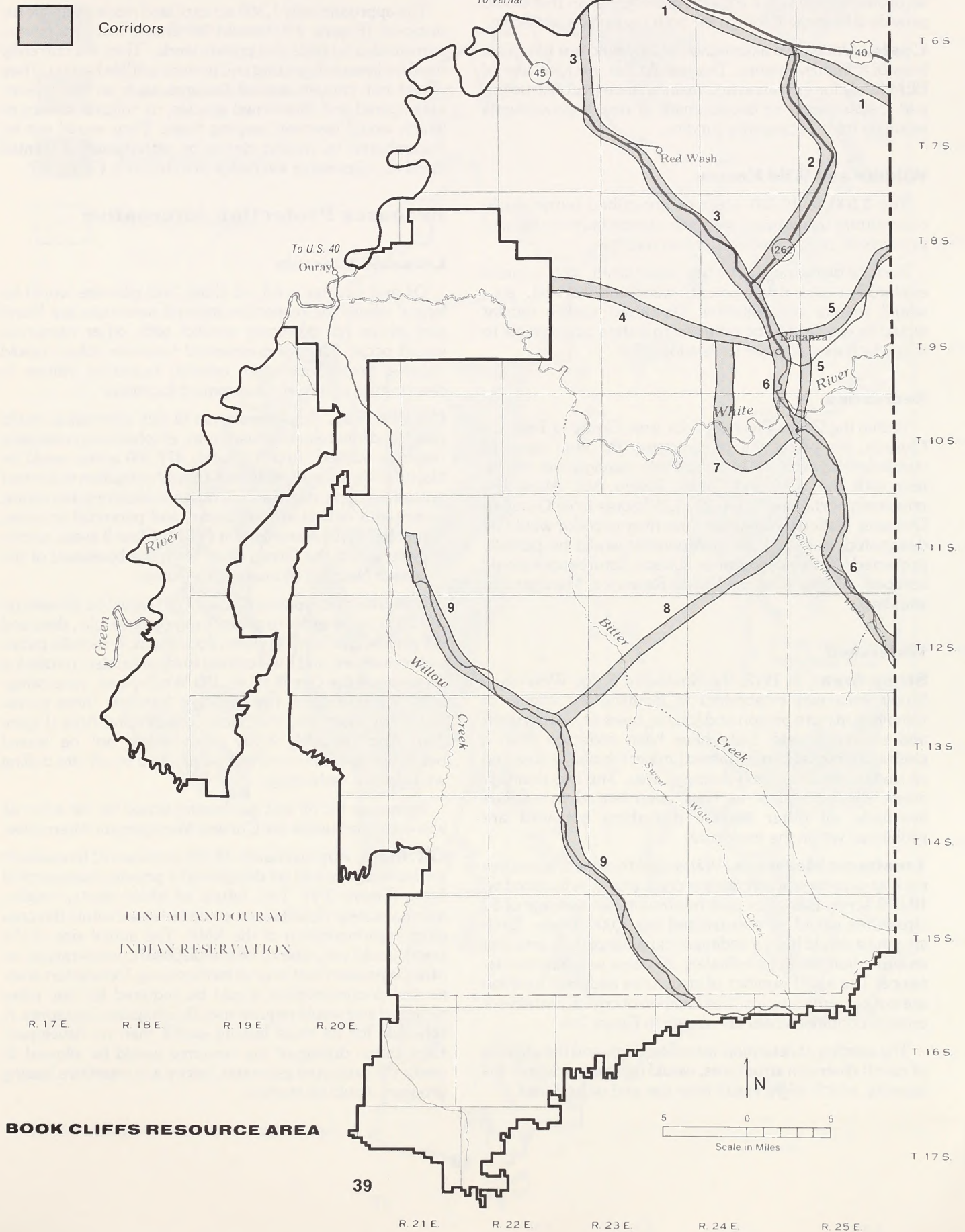


BOOK CLIFFS RESOURCE AREA



# UTILITY CORRIDORS (CURRENT MANAGEMENT ALTERNATIVE)

Figure 2 - 5





## CHAP. 2 - DESCRIPTIONS AND COMPARISONS OF ALTERNATIVES

Crucial wildlife habitat on Lower McCook Ridge would be protected through a rotation grazing system that would provide a balance of forage for both livestock and wildlife.

**Costs.** Under this alternative, BLM would not fund new livestock improvements. This would not exclude use of BLM funds for operation and maintenance (reconstruction and maintenance) or development of new improvements resulting from cooperative funding.

### Wildlife and Wild Horses

The 5,000 to 10,000 acres of prescribed burns would concentrate on mature sagebrush canyon bottoms located primarily in crucial wildlife summer habitats.

Surface-disturbing activities associated with mineral exploration and development, woodland harvest, etc., would require rehabilitation. Disturbed wildlife habitat would be required to be returned to a state comparable to that which existed prior to development.

### Recreation

Within the Green River corridor from Ouray to Tabyago Canyon, the placement of structures or other types of visible development would comply with management consistent with the Wild and Scenic Rivers Act. Along the remaining portions of the river, 5,250 acres from Ouray to Dinosaur National Monument, no river corridor would be designated, but the river environment would be partially protected. All development or surface disturbances would conform to the existing Visual Resource Management standard.

### Watershed

**Study Area.** In 1972, the Boulevard Ridge Watershed Study Area was established to examine the effects of removing mature pinyon and juniper trees on water runoff and sediment yield. Data have been collected from a chained (removal of pinyon and juniper) drainage area and an undisturbed (control) drainage area. The two drainage areas, totaling 330 acres have been fenced to exclude livestock; all other surface disturbing activities are prohibited within the enclosure.

**Treatment Measures.** Watershed treatment measures such as detention and retention dams would be installed on 10,000 acres. Based on past treatments, an average of 50 structures would be constructed per 1,000 acres. Each structure would have a sediment capacity of 0.25 acre-feet and function for approximately 20 years without maintenance. The exact number of structures and their location are not currently known. The location of critical and severe erosion condition areas are shown in Figure 2-6.

The seeding of detention-retention dams and the utilizing of runoff diversion structures, would minimize adverse soil impacts, which might result from gas and oil activities.

### Land Tenure Adjustment

The approximately 1,360 acres of land made available for disposal (Figure 2-7) would be small, isolated tracts, surrounded by state and private lands. They are currently used for livestock grazing and provide wildlife habitat. They would not contain special features such as floodplains, endangered and threatened species, or cultural resources which would warrant keeping them. They would not be encumbered by mining claims or withdrawals. Potential lands for disposal or exchange are shown in Figure 2-7.

### Resource Protection Alternative

#### Leasable Minerals

Oil and gas, tar sand, oil shale, and gilsonite would be leased where the respective mineral resources are found and where no significant conflict with other resources would occur. Critical nonmineral resource values would receive preference over mineral resource values in determining potential development locations.

**Oil and Gas.** Implementation of this alternative would place land into restricted use areas, emphasizing renewable resource values. Approximately 479,000 acres would be placed in Category 2, requiring special mitigation to protect critical antelope, deer, and elk range, critical riparian zones, severe and critical erosion areas, and perennial streams; Visual Resource Management (VRM) Class II areas, scenic highways; and the Green River from the boundary of the Dinosaur National Monument to Ouray.

No surface occupancy (Category 3) would be allowed on 51,000 acres in order to protect sage grouse leks, deer and elk calving and fawning areas, floodplains, wetlands, public water reserves, and a watershed study area; also, remaining areas along the Green River, the White River, nine campsites, six overlooks, two geologic features, three scenic travel corridors, and the Book Cliffs Natural Area (Figure 2-8). Approximately 8,000 acres would not be leased because the areas could not be reached by off-site drilling with current technology.

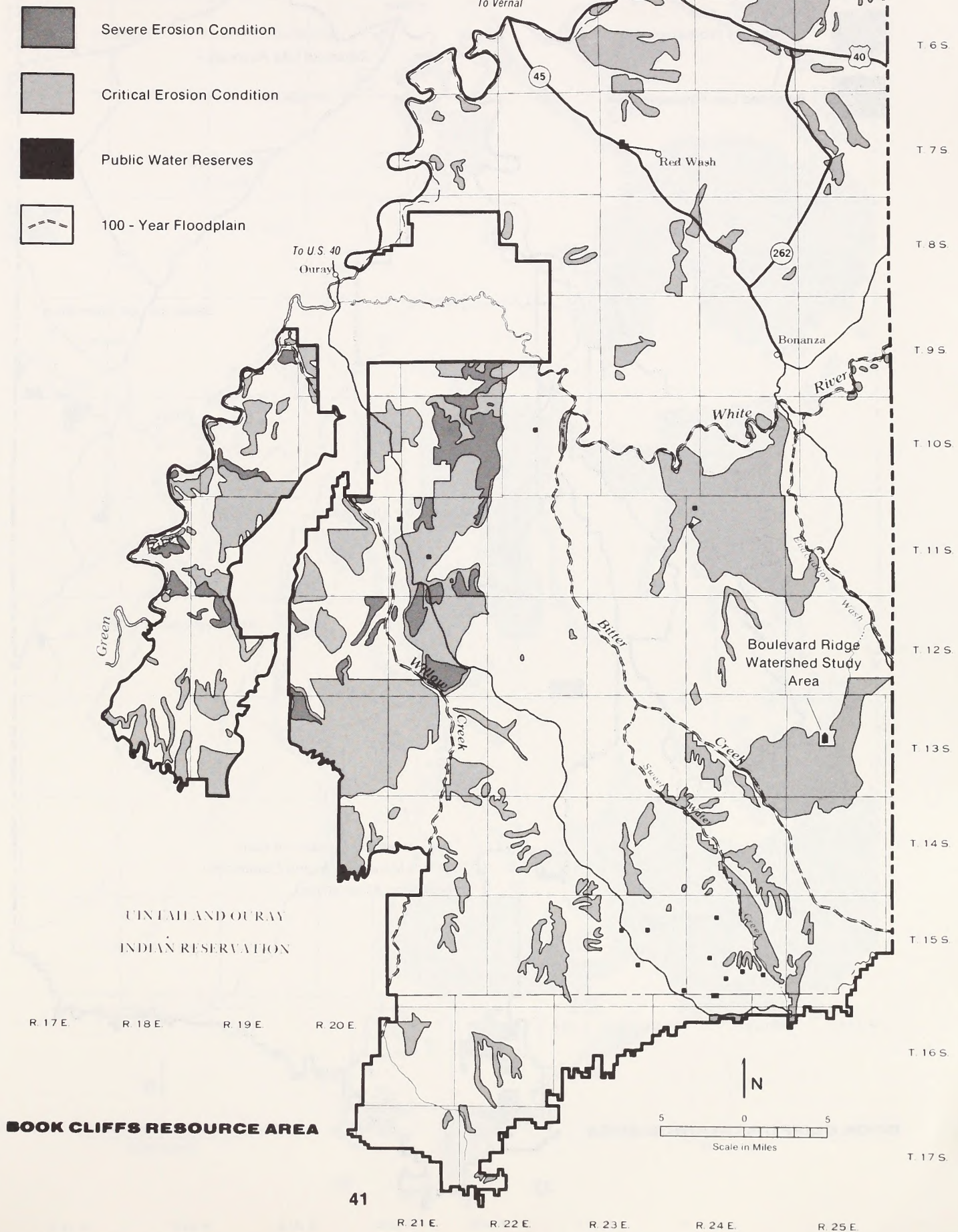
Mitigation for oil and gas leasing would be the same as was discussed under the Current Management Alternative.

**Oil Shale.** Approximately 18,000 acres would be available for lease and would be designated a priority management area, (Figure 2-9). Two future oil shale tracts, totaling approximately 10,500 acres, could be leased within this area after implementation of the RMP. The actual size of the tracts could vary due to offsite disposal considerations or other legislation that may be forthcoming. Detailed environmental documentation would be required for any lease proposal and would require specific mitigation measures. A schedule for oil shale leasing would then be developed. Exploration drilling of the resource would be allowed to verify the projected estimates before a competitive leasing program would be started.



# SOIL EROSION CONDITION CLASSES, FLOOD PLAINS, AND WATERSHED STUDY AREA

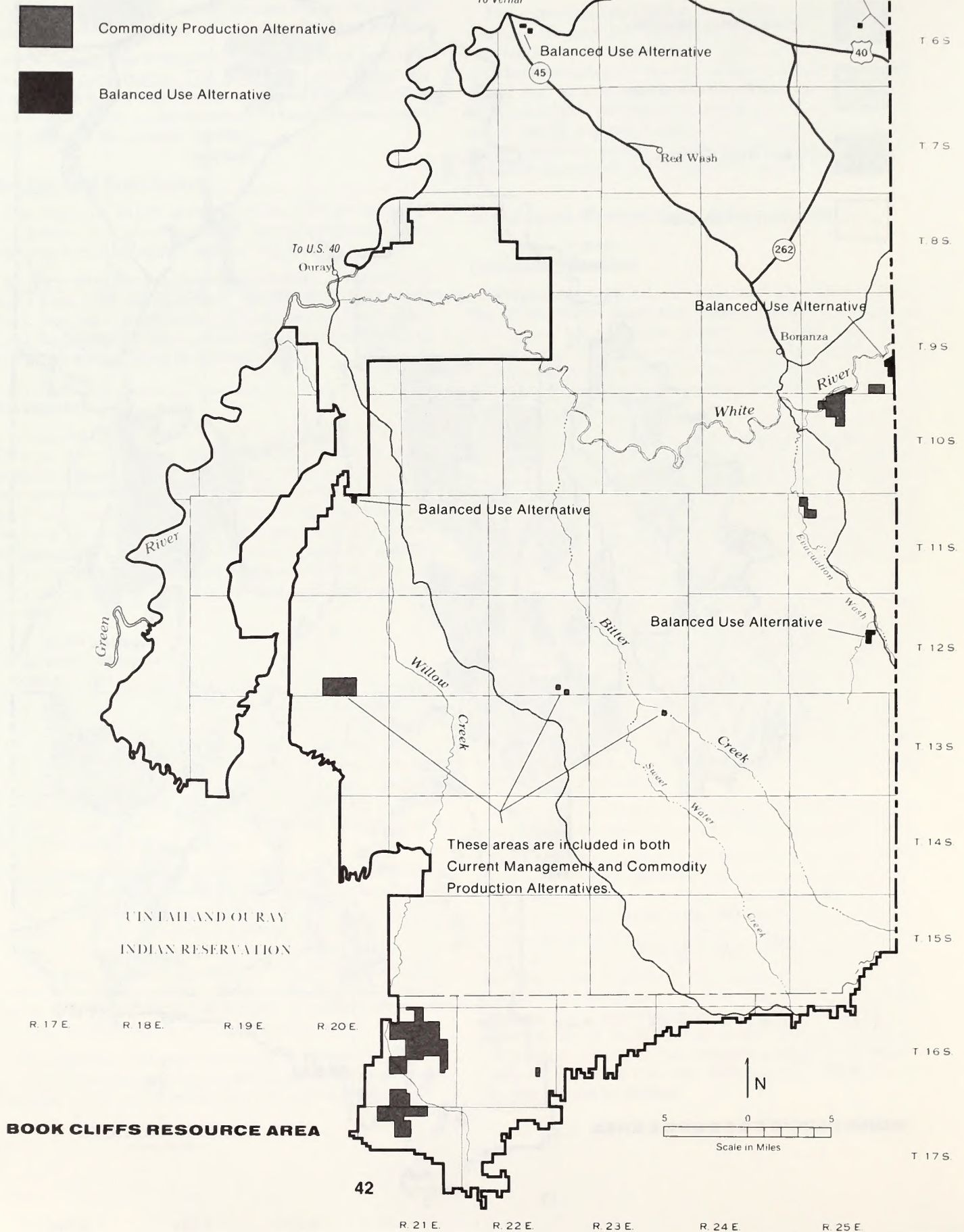
Figure 2 - 6





# POTENTIAL LAND DISPOSALS OR EXCHANGES (CURRENT MANAGEMENT, BALANCED USE, COMMODITY PRODUCTION ALTERNATIVES)

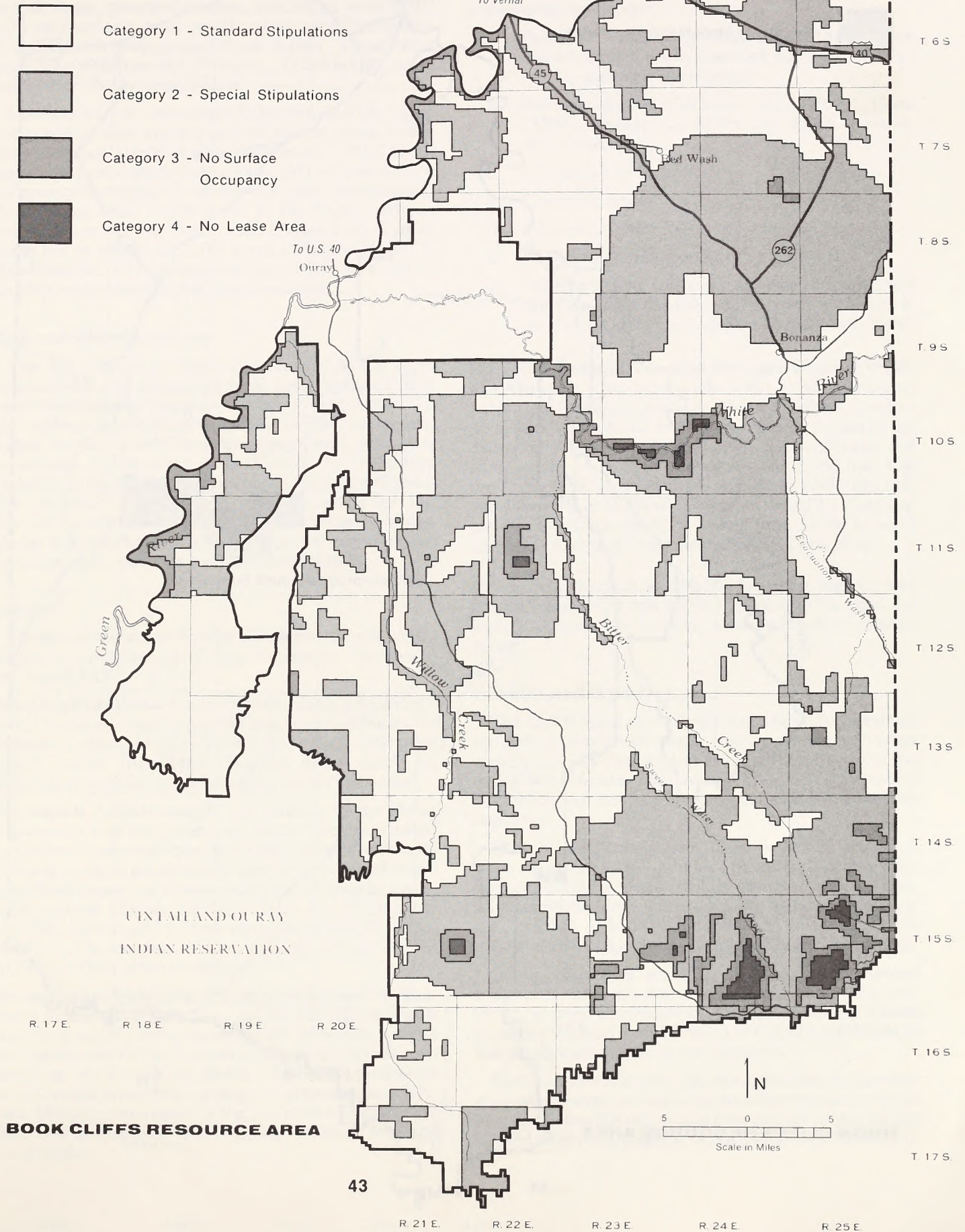
Figure 2 - 7





# OIL AND GAS LEASING CATEGORIES (RESOURCE PROTECTION ALTERNATIVE)

Figure 2 - 8



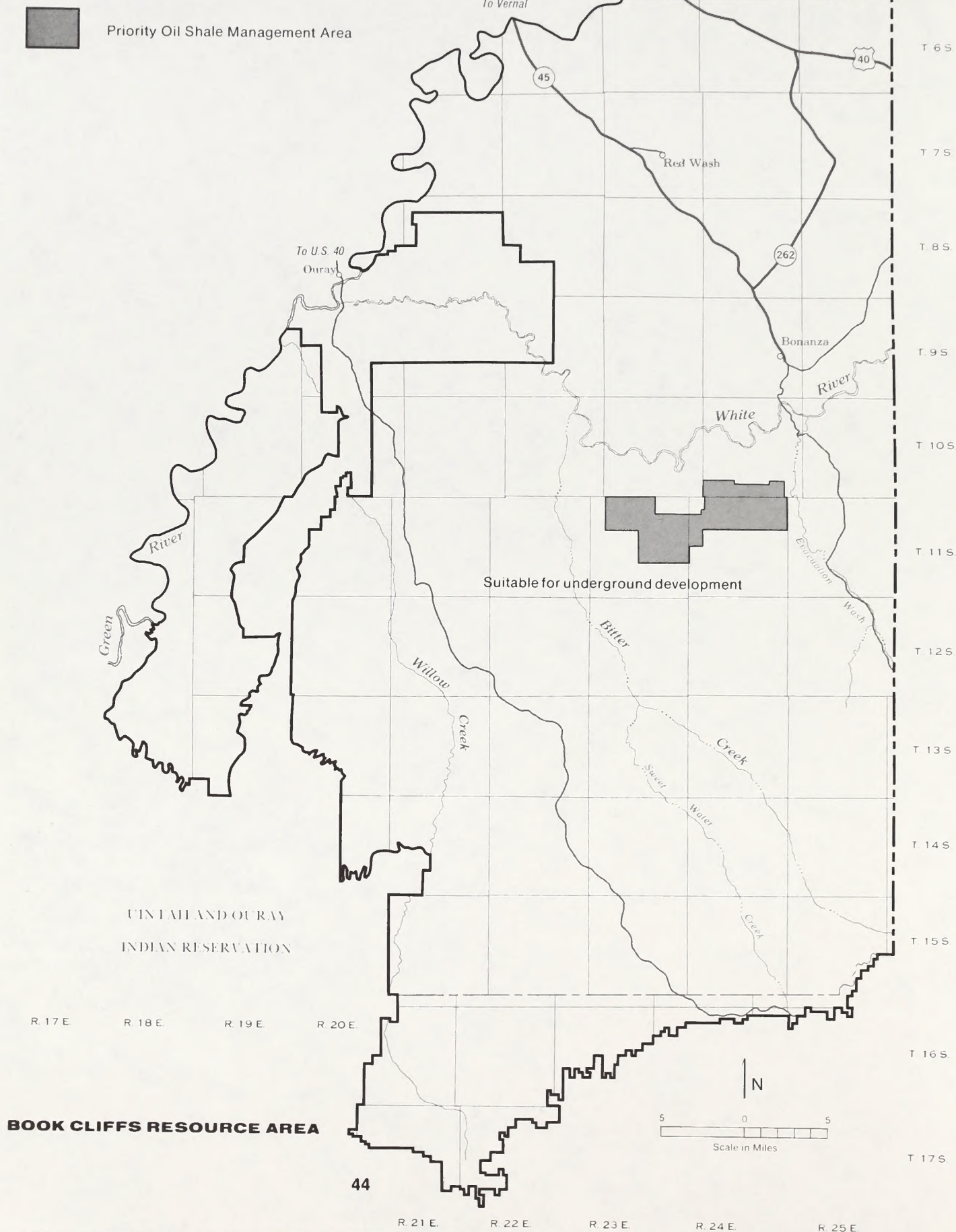


# OIL SHALE PRIORITY MANAGEMENT AREAS (RESOURCE PROTECTION ALTERNATIVE)

Figure 2 - 9



Priority Oil Shale Management Area





## CHAP. 2 - DESCRIPTIONS AND COMPARISONS OF ALTERNATIVES

**Tar Sand.** Potential conflict areas such as critical deer and elk range, perennial streams, productive woodlands, and critical erosion areas would require special mitigation (Category 2) to help protect those values. These areas would total 99,000 acres in PR Spring, 13,000 in Hill Creek, and 4,000 in Raven Ridge STSAs.

Conflicts with the Monument Ridge deer and elk migration corridor, deer fawning and elk calving areas, public water reserves, identified recreation areas, VRM Class II areas, and a watershed study area would preclude surface occupancy (Category 3) of any tar sand development. These areas total 70,000 acres in PR Spring with no additional acres in the other STSAs (Figure 2-10). Leases would not be issued on 12,000 acres within the Naval Oil Shale Reserve. All remaining areas in the STSAs would be handled under standard mitigating measures.

### Right-of-Way Corridors

The 150 miles of corridors consisting of 46,000 acres proposed for this alternative have been identified after considering industry's needs and other resource values. To give additional protection to wildlife habitat, severe and critical erosion areas, visual resources, and productive woodlands, 23,000 acres of land would be designated exclusion areas where no rights-of-way would be allowed. The proposed corridors and exclusion areas for this alternative are shown in Figure 2-11. Applications for rights-of-way and corridors outside of designated corridors and exclusion areas would be considered individually.

### Forage

Forage related actions for this alternative are outlined by allotment in Appendix 5 (Forage Actions by Alternative) and Figure 2-12.

**Grazing Practices.** Under this alternative, adjustments would be made in spring grazing practices to eliminate or decrease grazing impacts during the critical vegetative growth period (April-May). Current AMPs would be modified to minimize grazing impacts during this period.

**Livestock Adjustments.** In addition to the above adjustments in grazing practices, overall decreases would be made in livestock grazing use. These adjustments would be made to afford protection to specific critical wildlife and watershed areas, e.g. critical wintering or fawning areas, riparian areas, 100-year flood plain areas, etc. The number of AUMs authorized for livestock would be 53,373. This is 13,607 AUMs less than current average use and 49,542 AUMs less than active preference.

**Range Improvements.** Developments under this alternative would primarily improve wildlife habitat, ecological condition, and the natural environment. However, without the improvements, the downward adjustments to livestock would be much more significant. Vegetation treatments would include prescribed burning and pinyon-juniper clear-cuts. Mitigating measures for the proposed treatments are described in Appendix 8 (Mitigating Measures for Land Treatments).

**Implementation Schedule.** This alternative would be implemented as follows:

1. Begin the "5-year monitoring program" to determine any adjustment needs (livestock numbers, seasons of use, vegetative treatments).
2. Revise current allotment management plans (AMPs), develop new AMPs, and identify improvements needed.
3. Develop water facilities.
4. Construct fences.
5. Implement AMPs.
6. Develop land treatments.
7. Adjust stocking levels and seasons of use grazing practices in accordance with needs identified in monitoring and in consultation with affected users.

### Riparian Habitat, Floodplains, and Crucial Wildlife Habitat.

Approximately 5,950 acres of riparian habitat and floodplains would be afforded additional protection. Two hundred and ten acres would be fenced in the Sweetwater allotment. In the Green River allotment, 150 acres would be protected by eliminating cattle use. The remaining 5,590 acres in the Green River AMP, Birchell, and White River Bottoms allotments would be closed to grazing. Livestock would be limited from 14,000 acres of deer and elk crucial winter habitat on McCook Ridge.

**Costs.** Approximately \$342,000 would be used for new livestock improvements funded by BLM. This does not include cooperative projects, reconstruction or maintenance.

### Wildlife and Wild Horses

The 15,000 acres of prescribe burns would concentrate on mature sagebrush canyon bottoms, mature browse stands, and old chainings and burns that are becoming overgrown. Natural regeneration, mechanical reseeding and/or tubling transplants could be used to reestablish vegetation.

Four habitat management plans would be prepared. They would include plans for Blue Mountain (deer herd 26), Bonanza (antelope herd 7), East Bench (newly reestablished antelope herd) and Book Cliffs (deer herd 28A and elk herd 21). Wild horse management plans would be prepared for herds in the Hill Creek and Bonanza locations.





Surface-disturbing activities associated with mineral exploration and development, woodland harvest, etc. would require rehabilitation. Disturbed wildlife habitat would be required to be returned to a state comparable to that which existed prior to development.

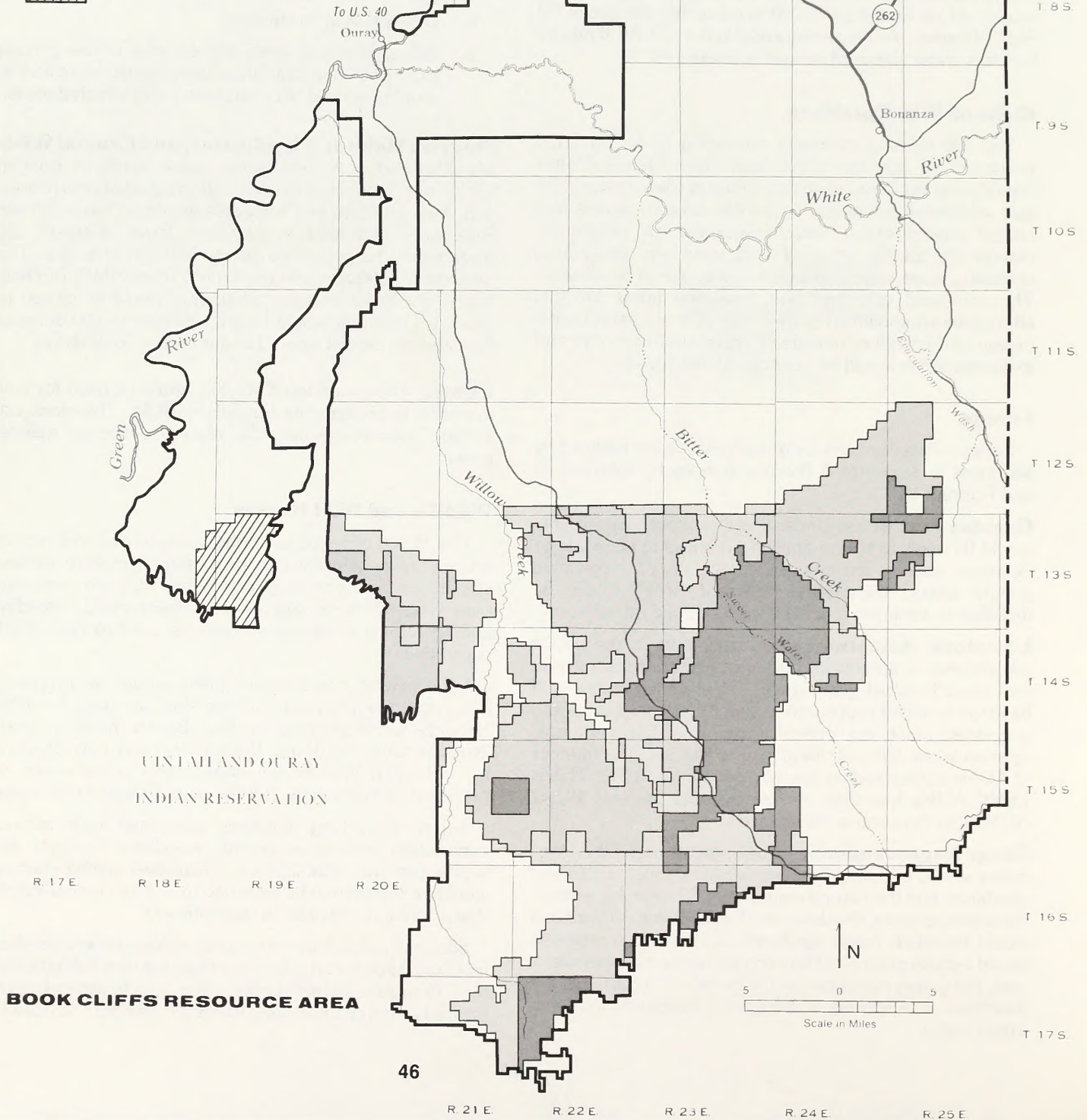
Seasonal restrictions on mineral exploration and development would occur on crucial antelope fawning habitat (from May 15 to June 20) and crucial deer and elk winter habitat located within chainings and burns (November 1 to April 1).



# TAR SAND LEASING CATEGORIES (RESOURCE PROTECTION ALTERNATIVE)


Figure 2 - 10


-  Category 1 - Standard Stipulations
-  Category 2 - Special Stipulations
-  Category 3 - No Surface Occupancy
-  Category 4 - No Lease Area

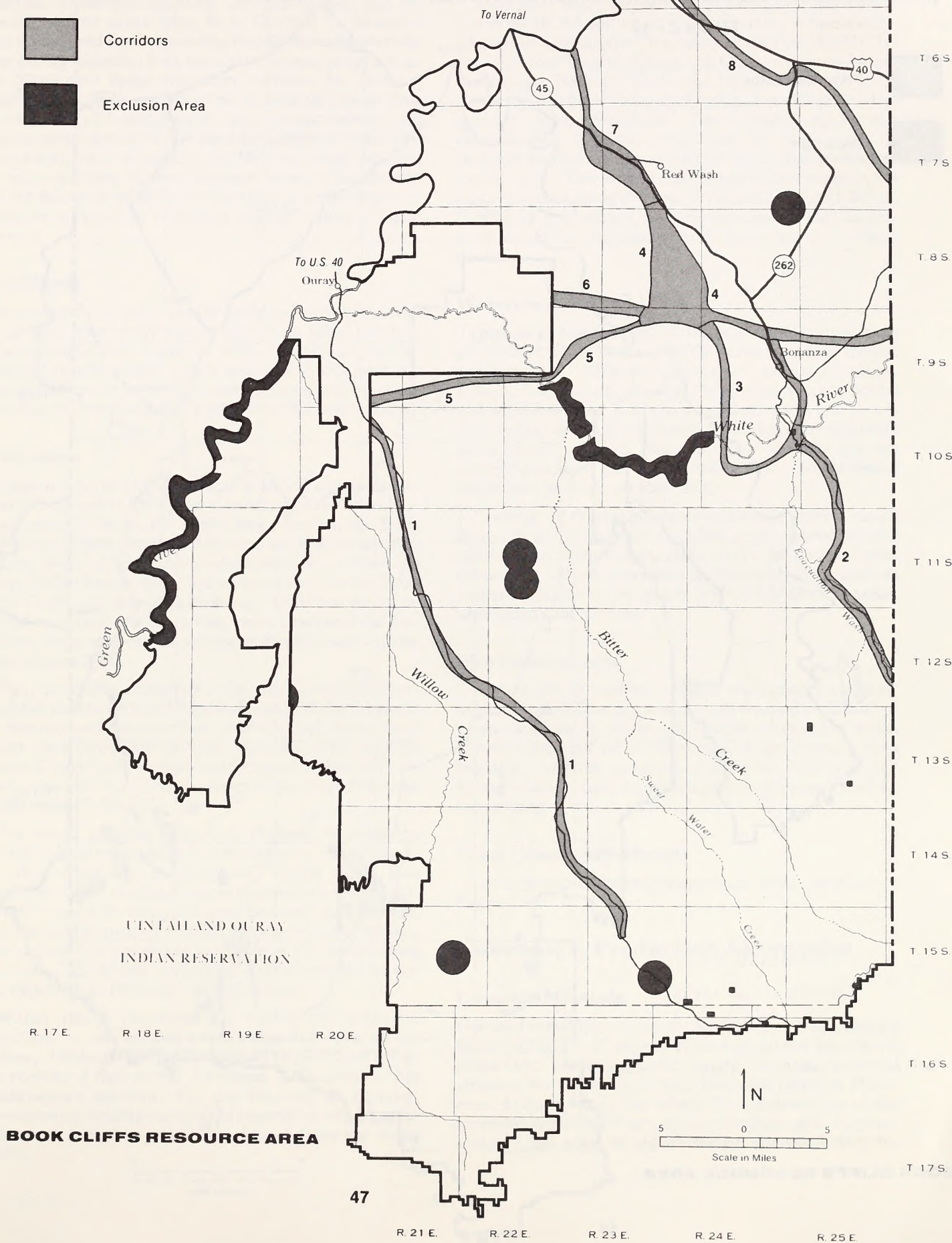




## 175

 Corridors

 Exclusion Area





# **VEGETATIVE TREATMENTS (RESOURCE PROTECTION ALTERNATIVE)**

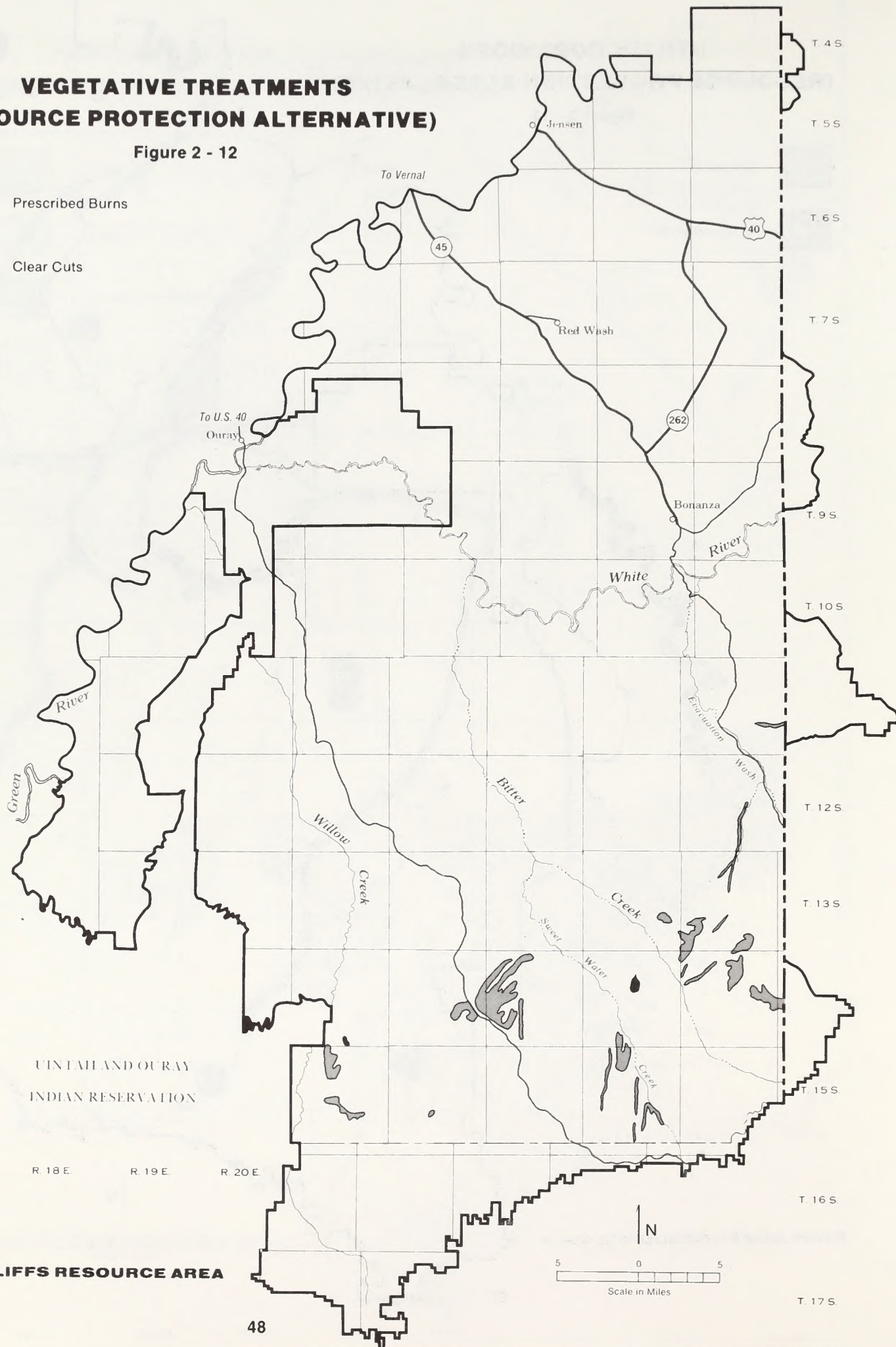
Figure 2 - 12



Prescribed Burns



Clear Cuts





## CHAP. 2 - DESCRIPTIONS AND COMPARISONS OF ALTERNATIVES

Seasonal protection would be afforded to deer and elk crucial summer areas (May 10 to October 1). Seasonal restrictions (mid-April to mid-May) would also apply to mule deer during migration from winter to summer range across the Monument Ridge migration corridor. No surface-occupancy restrictions would be utilized on crucial deer fawning and elk calving areas, sage grouse habitat, and important riparian zones. Tar sand exploration and development would not be allowed on the McCook Ridge deer and elk wintering area. Crucial antelope habitat (East Bench) lost to potential oil shale exploration and development would be replaced by additional suitable habitat of equal amount.

### Woodlands

No cottonwood or Douglas fir would be harvested except for salvage sales where stands have been killed due to a natural disaster such as wildfire. Allowable annual cut from managed pinyon-juniper stands would be 2,650 cords per year and 820 cords from old chainings, burns, and unproductive low-site woodlands for a total of 3,470 cords per year.

### Recreation

Up to a total of 418,600 acres, would be designated as limited or closed to ORV use. Closed areas would include severe erosion areas, the White River canyon, the Book Cliffs natural area, Boulevard Ridge watershed study plot, cultural sites, certain areas contiguous to the Uintah and Ouray Indian Reservation, and areas adjacent to the Book Cliffs Divide and Bonanza Highway. ORV use would be limited in critical erosion areas, certain recreational and cultural sites, and critical wildlife and wild horse habitat areas (Figure 2-13).

Two camp sites protected under the Current Management Alternative (Winter Ridge and Lower McCook) would be discontinued because their aesthetic and recreational values have been substantially degraded. One geologic feature (Duck Rock) would be added and the Point of Pines scenic overlook would be increased in size from 320 acres to 480 acres (Table 2-2).

The scenic corridor along U.S. Highway 40 would be located only on the north side of the highway and extend to the Blue Mountain escarpments, Figure 3-16. Two additional scenic corridors would be established. The first corridor would be along the new Bonanza highway and would extend from the Green River bridge south for 6 miles. The second corridor would extend from PR Spring along the Book Cliffs Divide road to the Utah/Colorado border and include both Dick and Fatty Canyons.

Within the 3 corridors, no visible above-ground structures would be permitted within 0.5 mile of the highway. Underground facilities would be permitted within the corridor if they would not create a disturbance that would attract attention. For the Highway 40 corridor, developments would be permitted beyond 0.5 mile from the highway only if they would not detract from the visual quality.

A corridor would be established along the Green River within the BCRA and would extend 0.5 miles or line of sight, whichever is closer, from the center of the river. Within this corridor from Tabyago Canyon to Ouray and from Jensen to Dinosaur National Monument, the placement of structures, surface disturbance or other types of visible developments would be prohibited. Developments outside this corridor that would be visible from the river would be designed to minimize impacts to the visual quality standard for that area. This area would contain 10,900 acres. In the remaining area along the river between Ouray and Jensen (3,500 acres), structures, developments, and surface disturbance would be designed to minimize impacts to visual quality.

### Watershed

**Treatment Measures.** Watershed treatment measures would be implemented on 98,800 acres in critical erosion condition and 12,300 acres in severe erosion condition. Areas of high natural, geologic erosion rates would not be treated if they have low resource values and a low probability of success. Approximately 5,550 detention-retention dams would be built; however, their location are not currently known. Figure 2-6 identifies the location of critical and severe erosion condition areas.

Seeding of detention-retention dams, utilizing runoff diversion structures and retention ponds where mineral development disturb the surface, would minimize adverse impacts to soils. Additionally, special restrictions such as seasonal shutdowns in severe and critical erosion areas, would decrease soil loss.

### Fire Management

A program of modified wildfire suppression would be utilized on 965,500 acres, where control would be difficult or where other significant resource values would not be at risk of being damaged. At the discretion of the Resource Area Manager, wildfires could be allowed to burn until self extinguished or until significant resource values could be jeopardized.

### Land Tenure Adjustment

Lands proposed for exchange or acquisition are shown in Figure 2-14.

## Commodity Production Alternative

### Leasable Minerals

**Oil and Gas.** Approximately 35,000 acres would require special mitigation (Category 2) for sage grouse leks, floodplains and wetlands, public water reserves, perennial streams, the Green River from Dinosaur National Monument to Sand Wash, the White River downstream of the proposed White River Dam, and four campgrounds. Approximately 3,000 acres of key recreation areas including the



## CHAP. 2 - DESCRIPTIONS AND COMPARISONS OF ALTERNATIVES

Table 2-2  
MANAGEMENT ALTERNATIVES-RECREATION ACTIONS  
Hunter Camps, Scenic Overlooks, Sightseeing

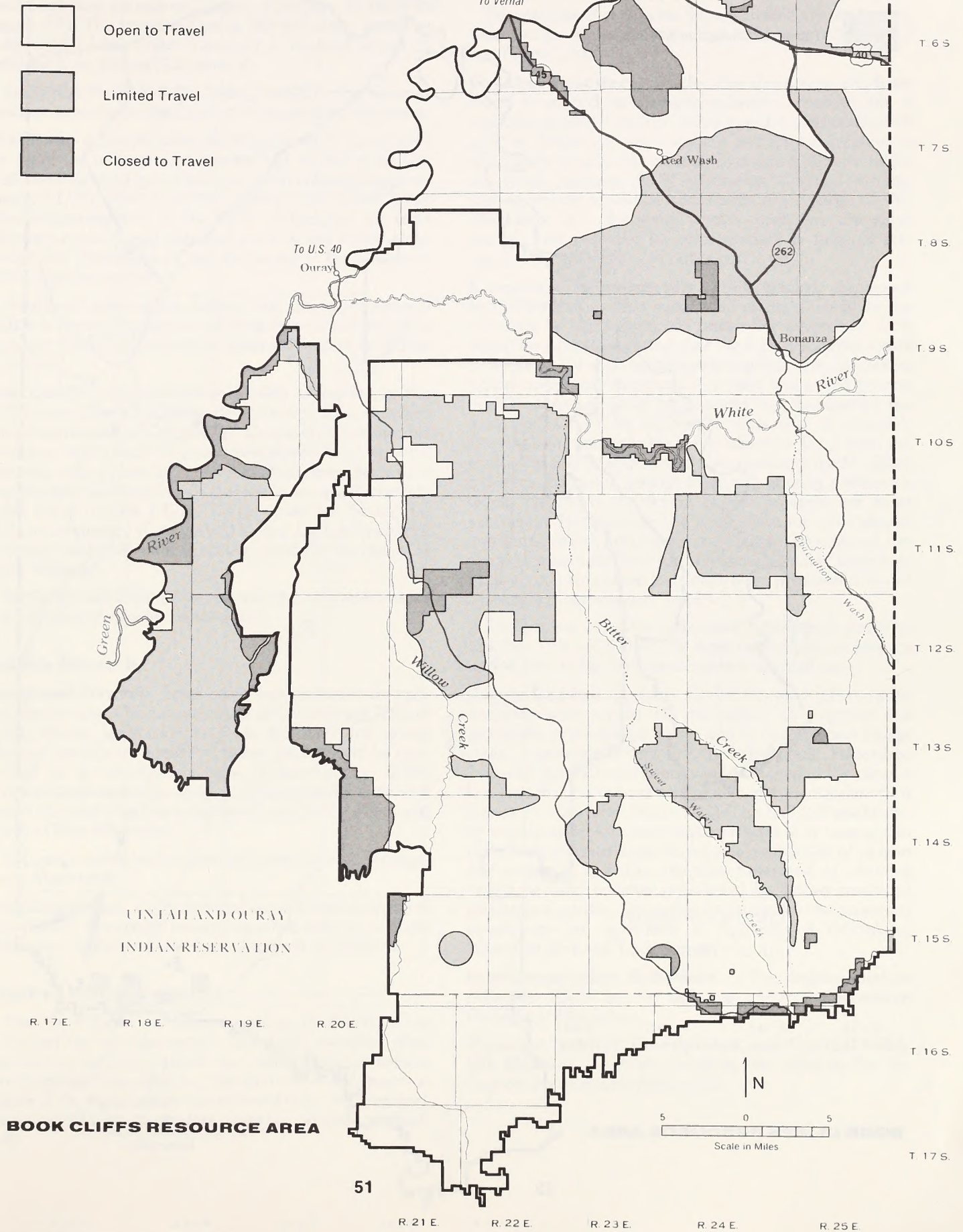
LEGEND: R=Retained; D=Dropped; P=Proposed

Type of Site	Name of Site	Alternatives			
		Current Management	Resource Protection	Commodity Production	Balanced Use
Hunter Camps	PR Spring	R	R	R	R
	Hide Out	R	R	R	R
	Chicken Spring	R	R	R	R
	Book Cliffs Rim	R	R	R	R
	Aspen Hollow	R	R	D	D
	Atchee Ridge	R	R	D	R
	South Canyon	R	R	D	D
	Lee Canyon	R	R	D	D
	Point of Pines	R	R	D	D
	Seep Ridge	R	R	D	D
	Meadow Ridge	R	R	D	D
	Willow Canyon	R	R	D	D
	Flat Rock	R	R	D	D
	(Massey Junction)				
	Lower McCook	R	D	D	D
	Winter Ridge	R	D	D	D
Scenic Overlooks	Point of Pines	R	R	R	R
	Grand Valley	R	R	D	D
	Doc Valley	R	R	D	D
	Split Mountain	R	R	D	D
	Musket Shot				
	Springs	R	R	D	D
	Willow Creek	R	R	D	D
Scenic Corridors	U.S. Highway 40	R	R	D	R
	Bonanza Highway	-	P	P	P
	Book Cliffs				
	Divide	-	P	P	P
Geologic Features	Duck Rock	-	P	P	P
	Fantasy Canyon	R	R	R	R



# **OFF-ROAD VEHICLE DESIGNATION (RESOURCE PROTECTION ALTERNATIVE)**

Figure 2 - 13

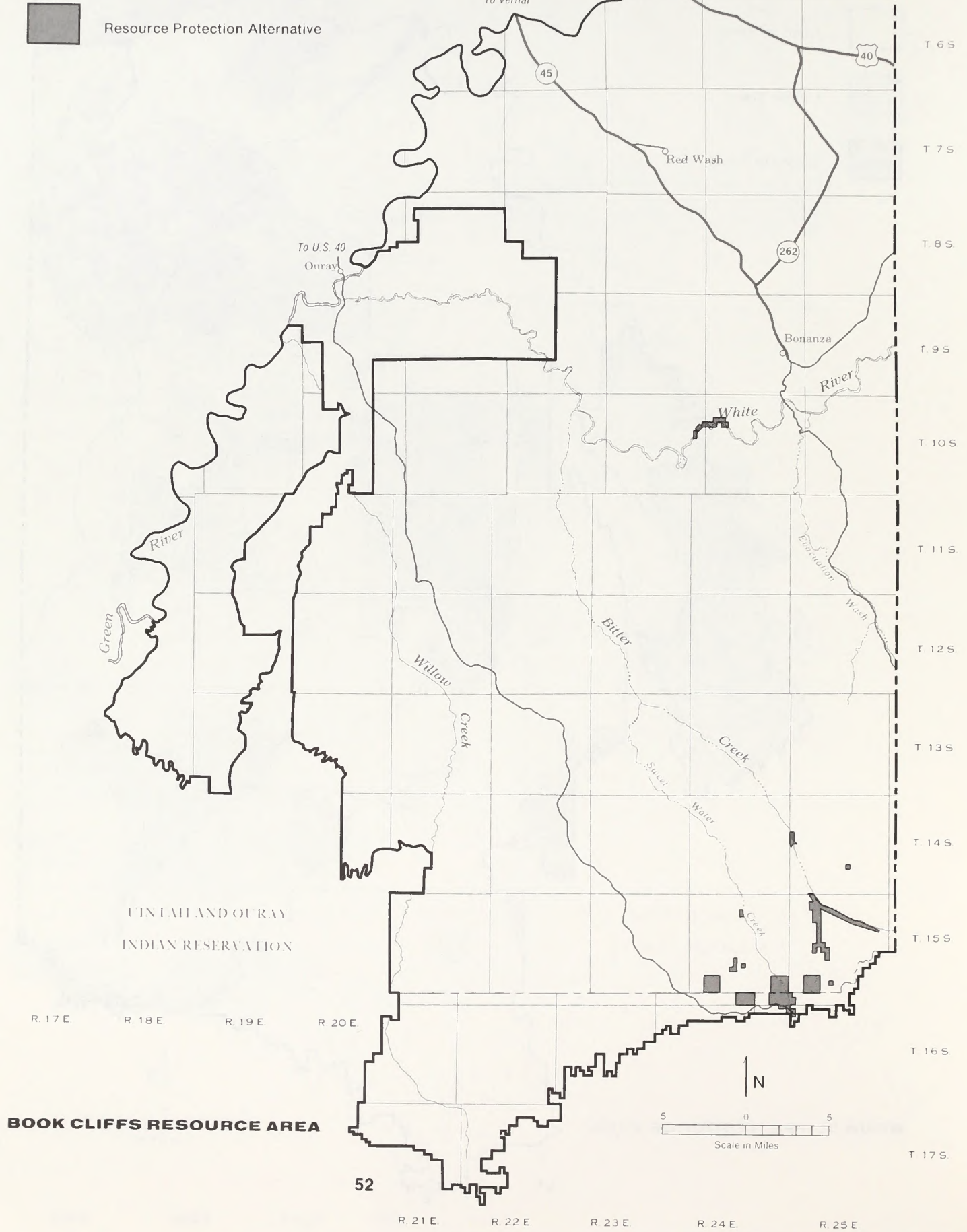


BOOK CLIFFS RESOURCE AREA



# POTENTIAL LANDS ACQUISITION FOR RESOURCE PROTECTION ALTERNATIVE

Figure 2 - 14





## CHAP. 2 - DESCRIPTIONS AND COMPARISONS OF ALTERNATIVES

Green River from Sand Wash to Tabyago would be protected from surface occupancy (Category 3). Refer to Figure 2-15. The remaining lands, 989,000 acres, would be available for lease under Category 1. No land would be withheld from leasing (Category 4).

Mitigation for oil and gas leasing would be the same as was discussed under the Current Management Alternative.

**Oil Shale.** Approximately 84,000 acres would be available for lease for underground mining and 14,000 acres, for in-situ development (Figure 2-16). Four tracts consisting of approximately 21,000 acres could be located within these areas after implementation of the RMP. Scheduling for tract delineation and size of potential tracts would be the same under this alternative as are discussed in the Resource Protection Alternative.

Additional exploration drilling data on approximately 33,000 acres outside known oil shale lease areas would be required before a competitive leasing program would be developed.

**Tar Sand.** Approximately 201,000 acres within the STSAs would be available for development using standard mitigating measures (Category 1). Conflicts with renewable resource values such as public water reserves, perennial streams, sage grouse leks, and identified campsites would require special mitigation (Category 2) on approximately 4,000 acres (Figure 2-17). There would not be any no surface occupancy (Category 3) leases. Leases would not be issued on 12,000 acres (Category 4) within the Naval Oil Shale Reserve.

Mitigation would be the same under this alternative as for the Resource Protection Alternative.

### Salable Minerals

**Sand and Gravel.** Sales could be conducted to meet demand on areas having sand and gravel deposits (Figure 2-18). Where application is made for sand and gravel disposal outside the identified areas, sales would be conducted on a case-by-case basis. Approximately 12,500 acres of land would be designated as potential sand and gravel disposal sites along the Green and White rivers and south of Blue Mountain.

Mitigation would be the same as for the Current Management Alternative.

**Building Stone.** Collection and use of the stone in the in-situ oil shale area could be accomplished prior to oil shale development construction through permit stipulations.

### Right-of-Way Corridors

The 330 miles of corridors consisting of 174,000 acres proposed for this alternative have been identified after considering industry's needs and other resource values. The proposed corridors for this alternative are shown in Figure 2-19. Applications for rights-of-way and corridors outside of designated corridors would be considered individually.

### Forage

Forage related actions for this alternative are outlined by allotment in Appendix 5 (Forage Actions by Alternative) and Figure 2-20.

**Grazing Practices.** Under this alternative, emphasis would be placed on maximizing livestock production. It would be achieved through revision and implementation of existing AMPs and development and implementation of new AMPs or grazing systems. The new AMPs would be developed primarily on "I" allotments. Current management practices would be continued on a number of "M" allotments i.e., allotments where conditions are satisfactory, the potential for improvement is minimal and significant conflicts would not occur.

**Livestock Adjustments.** Full grazing preference (active preference plus suspended nonuse) would be the objective for authorized use under this alternative. This would be attained provided that the forage potential exists in an allotment and that minerals development operations would not impose decreases in livestock use. Full grazing preference would meet full livestock use demand for the area and would be consistent with this alternative's emphasis on domestic forage production. Data from the ecological site, condition, and soils inventory (BLM 1982a) indicates that on a general basis, full grazing preference would be within the scope of site potential for most allotments. However, on the lower elevation sites (desert and semi-desert), full preference might not be attained. On the higher elevation sites (upland and mountain), there may be potential to exceed full preference provided it is not limited by other resource uses.

The number of AUMs authorized for livestock would be 109,485. This is 6,570 AUMs more than active preference and 42,505 AUMs more than current average use.

**Range Improvements.** Under this alternative, range improvements would be developed to improve the availability of unutilized forage and to develop new forage where a potential exists to benefit livestock. Prescribed burns or chemical treatment would be used in the canyon bottoms and on upland bench sites with dense decadent stands of sagebrush (Figure 2-20). This method would also be used in areas with over mature stands of browse and in previously chained areas to prevent reinvasion of pinyon and juniper. Clear cuts, chemical treatment, or chaining would be used on sites dominated by closed stands of pinyon and juniper. Mitigating measures for the proposed treatments are described in Appendix 8 (Mitigating Measures for Land Treatments).

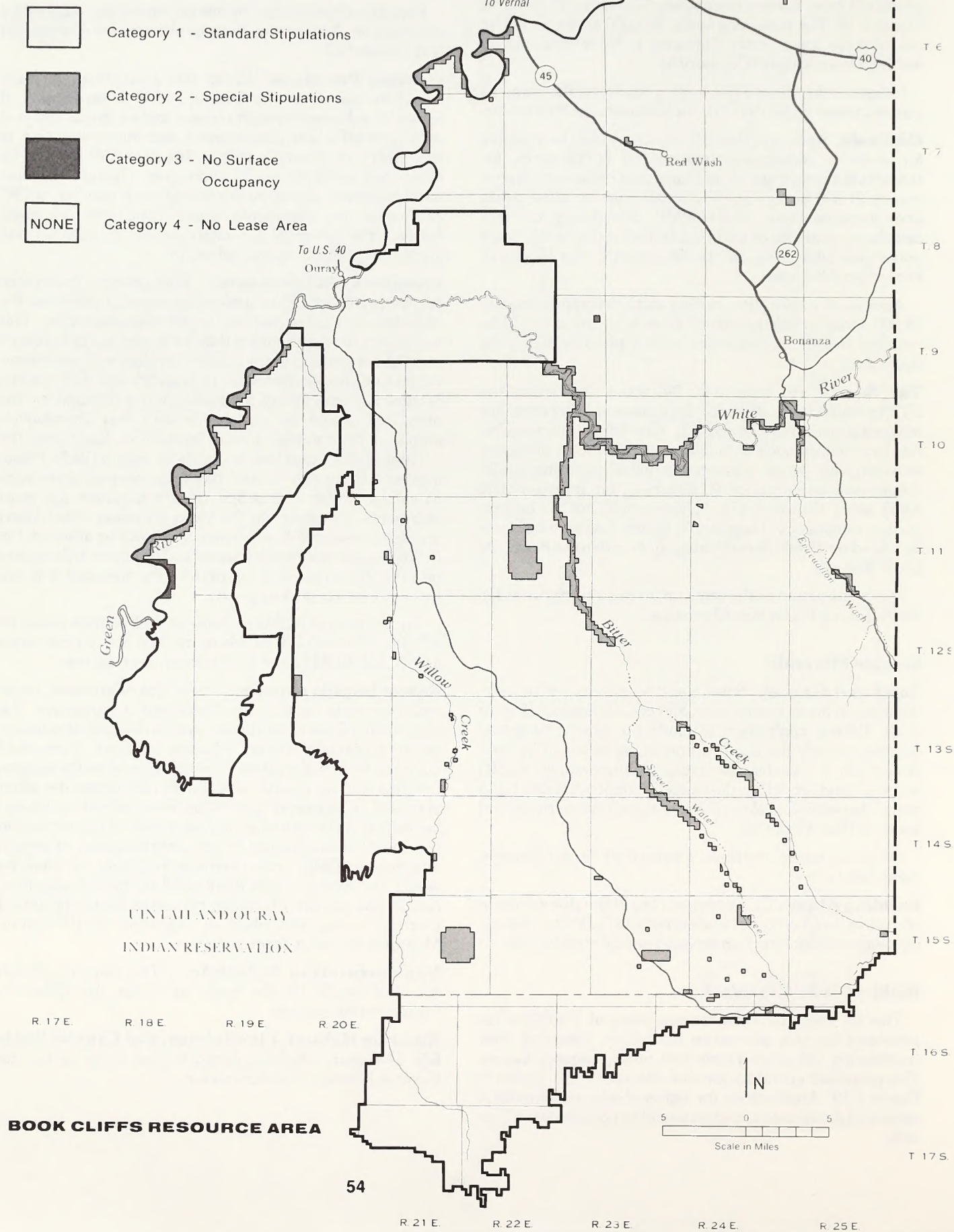
**Implementation Schedule.** The implementation schedule would be the same as under the Resource Protection Alternative.

**Riparian Habitat, Floodplains, and Crucial Wildlife Habitat.** Actions would be the same as for the Current Management Alternative.



# OIL AND GAS LEASING CATEGORIES (COMMODITY PRODUCTION ALTERNATIVE)

Figure 2 - 15



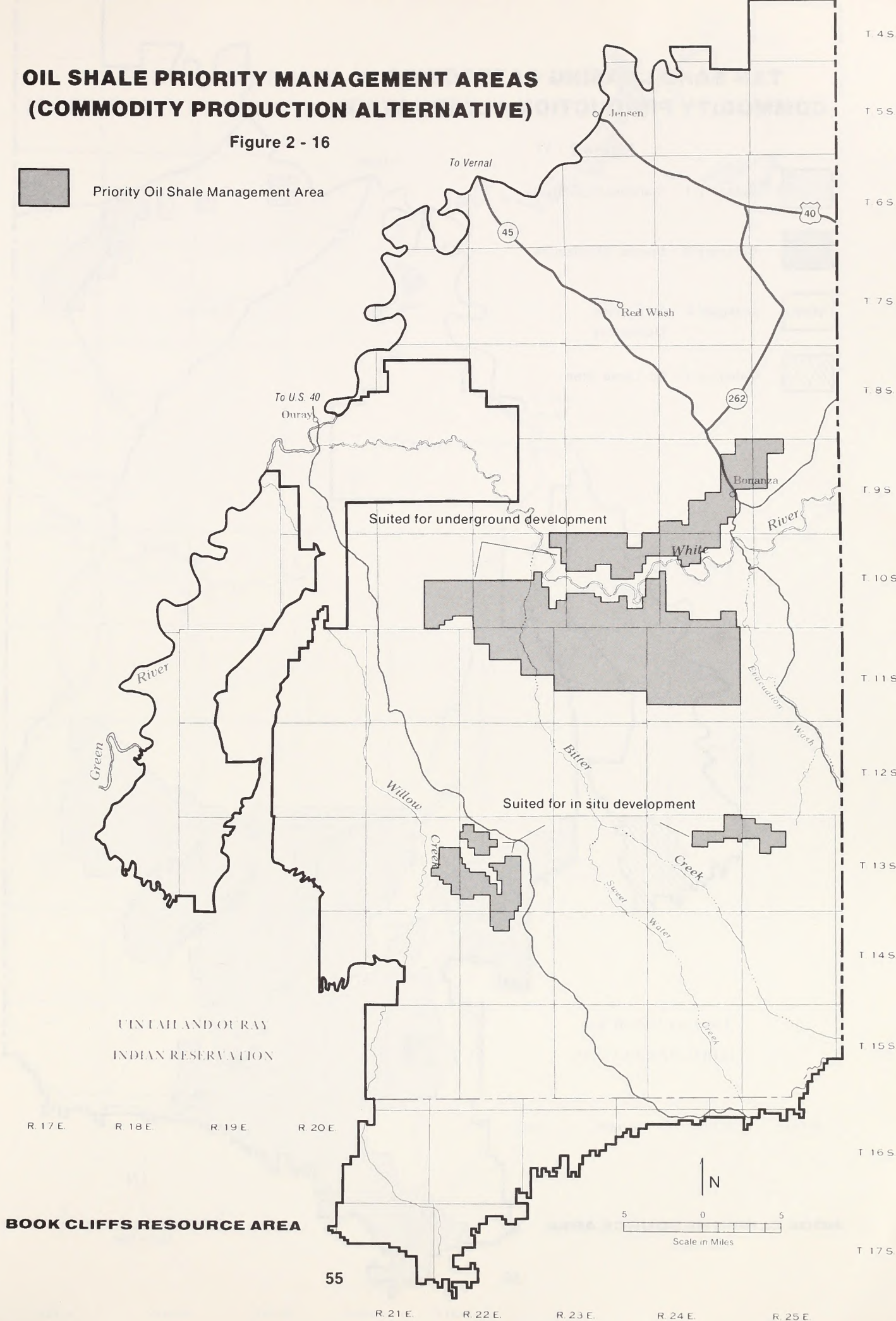


# **OIL SHALE PRIORITY MANAGEMENT AREAS (COMMODITY PRODUCTION ALTERNATIVE)**

Figure 2 - 16







Priority Oil Shale Management Area

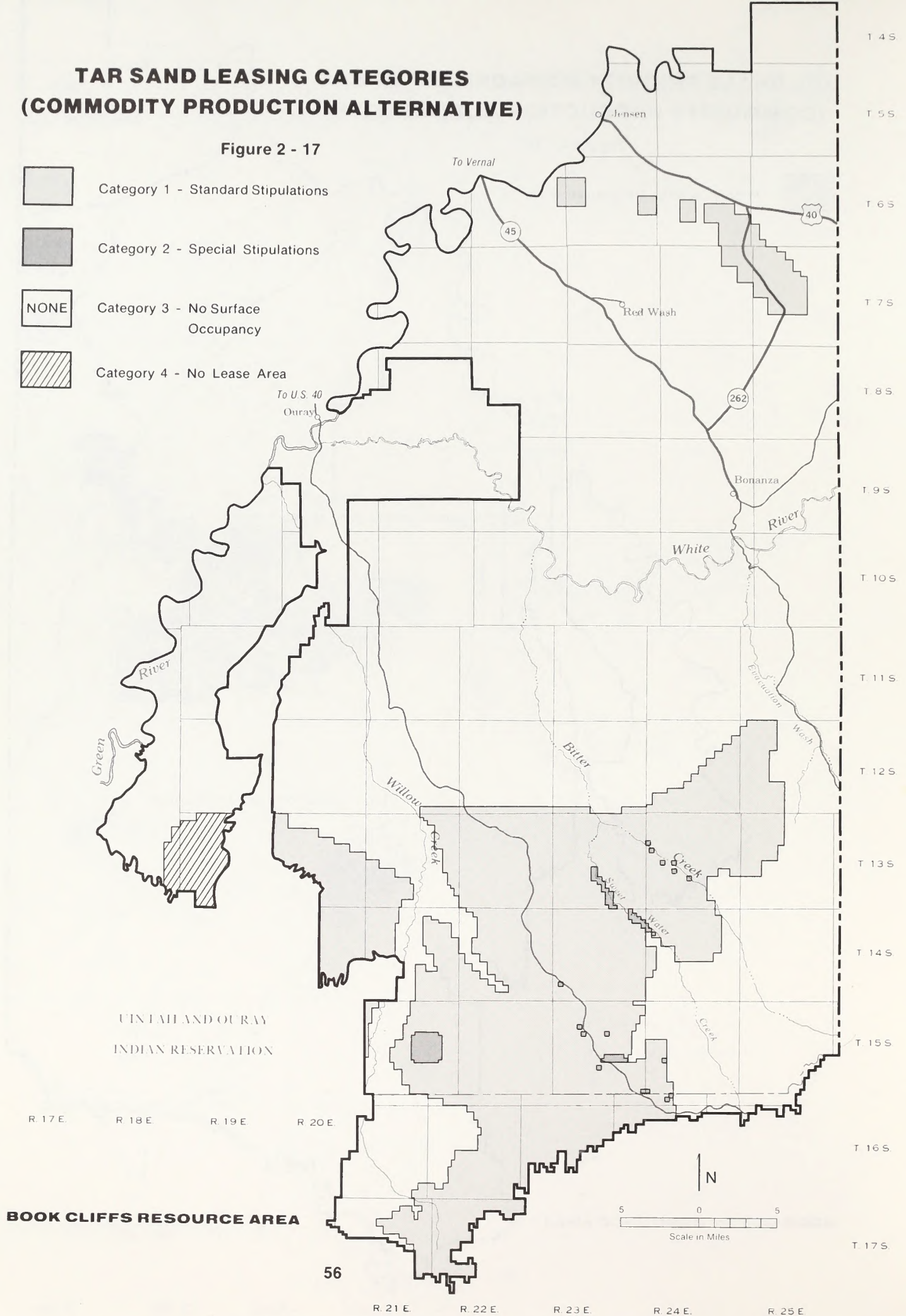




# TAR SAND LEASING CATEGORIES (COMMODITY PRODUCTION ALTERNATIVE)

Figure 2 - 17

-  Category 1 - Standard Stipulations
-  Category 2 - Special Stipulations
-  NONE Category 3 - No Surface Occupancy
-  Category 4 - No Lease Area



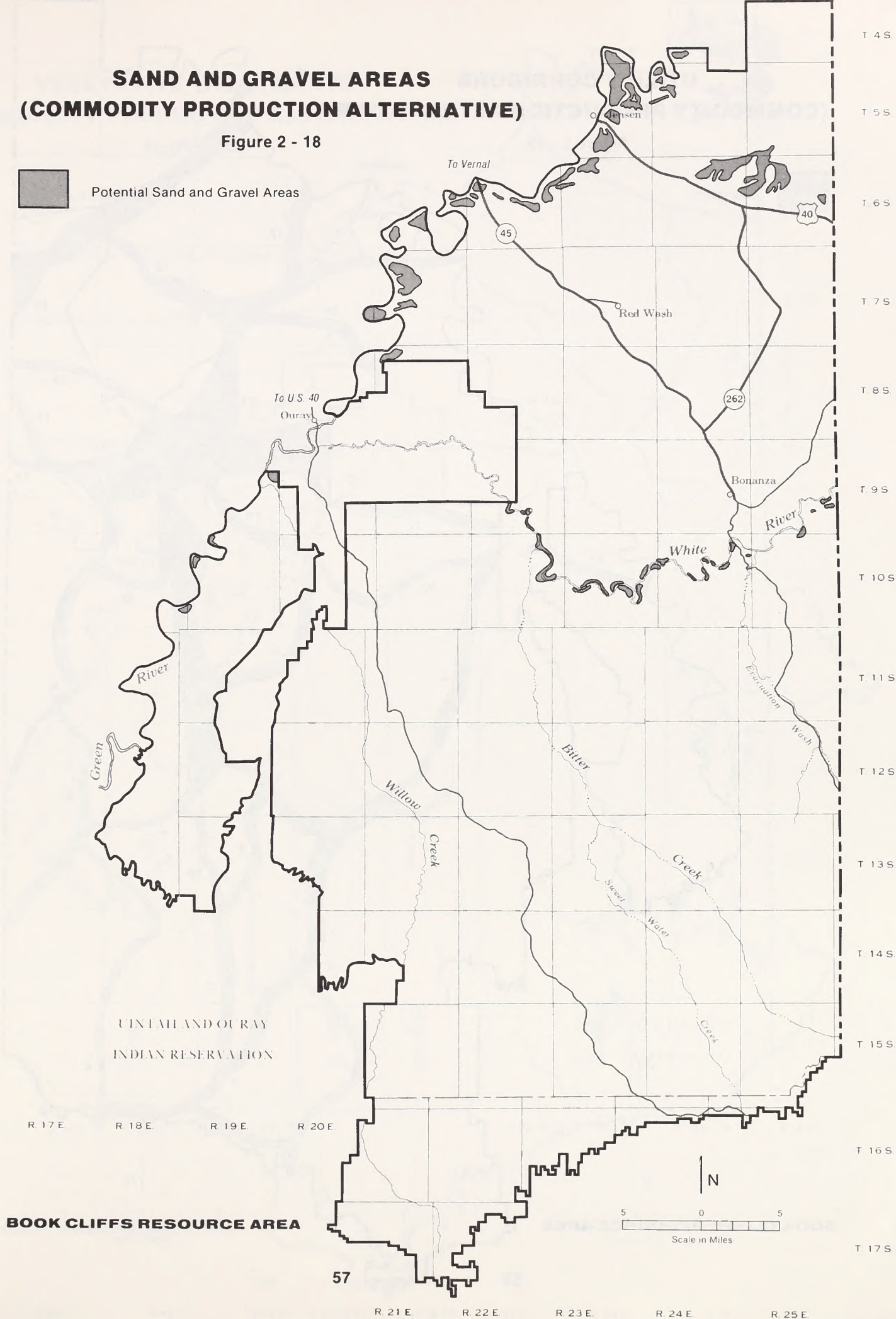


# **SAND AND GRAVEL AREAS (COMMODITY PRODUCTION ALTERNATIVE)**

Figure 2 - 18



Potential Sand and Gravel Areas



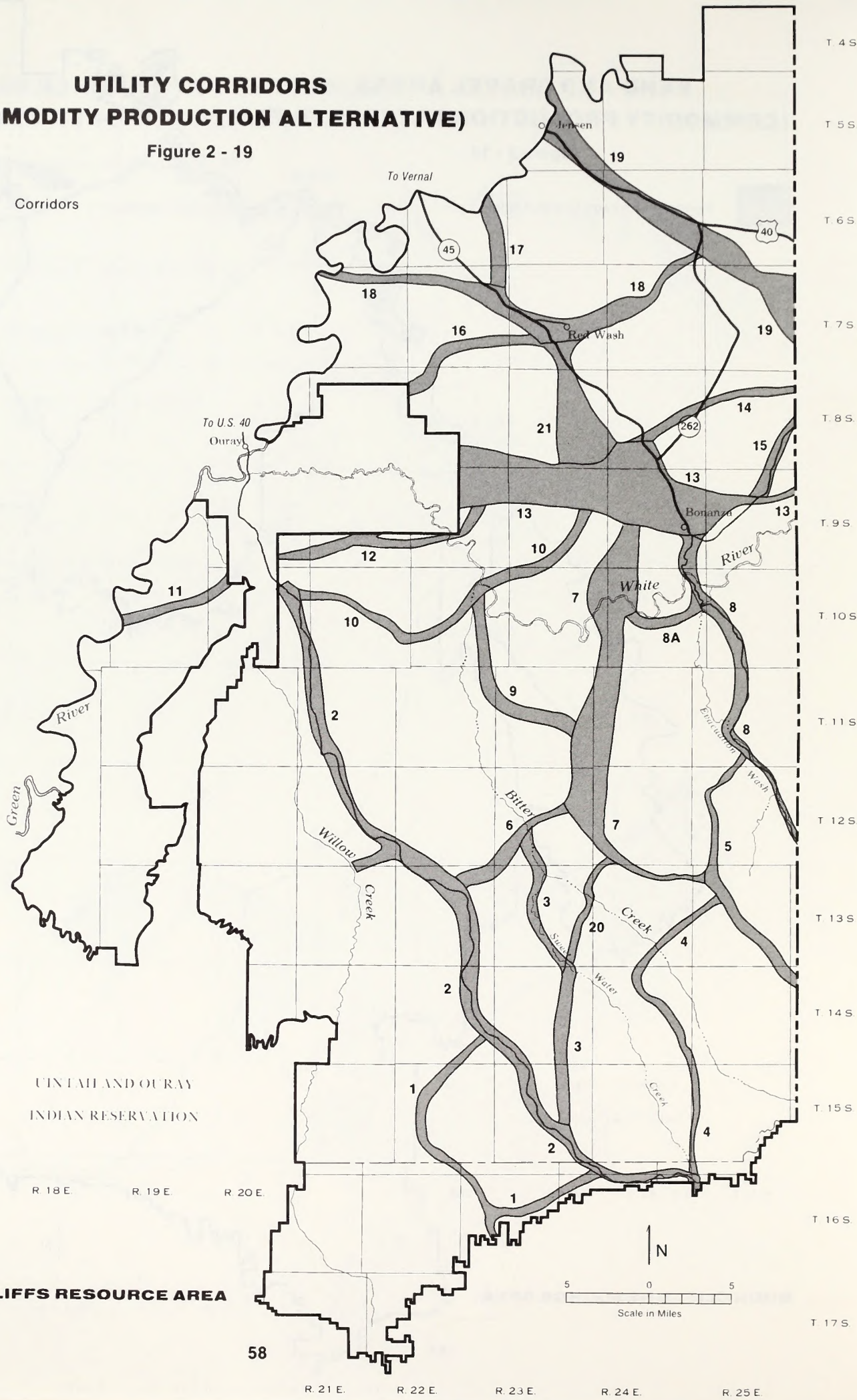


# UTILITY CORRIDORS (COMMODITY PRODUCTION ALTERNATIVE)

Figure 2 - 19



Corridors



UINTAH AND OURAY  
INDIAN RESERVATION

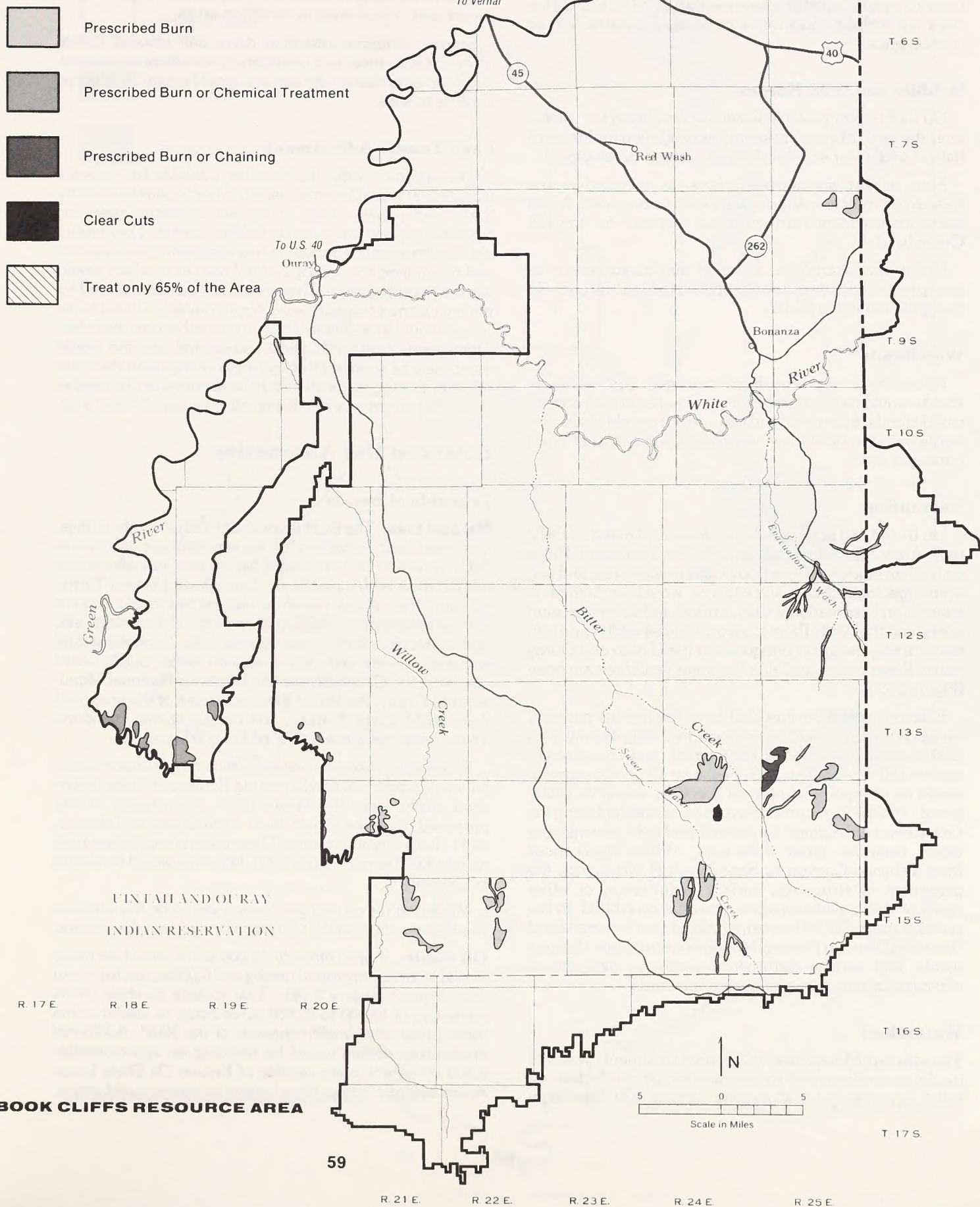
R. 17 E. R. 18 E. R. 19 E. R. 20 E.

BOOK CLIFFS RESOURCE AREA



# VEGETATIVE TREATMENTS (COMMODITY PRODUCTION ALTERNATIVE)

Figure 2 - 20





## CHAP. 2 - DESCRIPTIONS AND COMPARISONS OF ALTERNATIVES

**Costs.** Approximately \$813,000 to \$870,000 would be used for new livestock improvements funded by BLM. This does not include cooperative projects, reconstruction or maintenance.

### Wildlife and Wild Horses

Up to 20 water projects would be developed for wildlife over the next 10 years, primarily as mitigation for losses of habitat and water sources through mineral development.

Four habitat management plans, as specified in the Resource Protection Alternative, would be prepared. A wild horse management plan would be prepared for the Hill Creek herd.

Under this alternative, seasonal and no-surface-occupancy restrictions would not be applied to big game and wild horse habitat in the BCRA.

### Woodlands

Allowable annual cut from managed pinyon-juniper stands would be 2,300 cords; from Douglas fir and cottonwood stands, 610 cords; and 820 cords from old chainings, burns and non-productive woodlands, for a total of 3,730 cords per year.

### Recreation

Up to 148,160 acres would be closed or limited to ORV use. Areas closed would include the Boulevard Ridge watershed study area, the Book Cliffs natural area, and two scenic geologic areas. Vehicle use would be limited in cultural and recreational sites, critical and severe erosion areas, and the White River Canyon. Crucial wildlife and wild horse areas, the area contiguous to the Uintah and Ouray Indian Reservation, and all other areas would remain open (Figure 2-21).

Existing recreation sites that have the highest potential for development would be retained, including 4 camp sites (280 acres), one overlook (320 acres), and one geologic feature (60 acres). The U.S. Highway 40 scenic corridor would be dropped and no new corridors would be established (Table 2-2). A corridor would be established along the Green River extending 0.5 miles or line of sight, whichever is closer, from the center of the river. Within this corridor from Tabyago Canyon to Sand Wash (1,900 acres), the placement of structures, surface disturbance, or other types of visible developments would be prohibited. In the remaining area (12,500 acres), along the river between Sand Wash and Dinosaur National Monument, structures, developments, and surface disturbance would be designed to minimize impacts to visual quality standards.

### Watershed

**Treatment Measures.** Watershed treatment measures would be implemented to increase forage production on 6,400 acres in four allotments. About 320 detention-

retention dams would be built; however, their locations are not currently known. Refer to Figure 2-6 for the location of severe and critical erosion condition areas.

Seeding detention-retention dams and utilizing runoff diversion structures and retention ponds wherever mineral developments disturb the surface, would minimize adverse impacts to soils.

### Land Tenure Adjustment

The approximately 16,000 acres available for disposal (Figure 2-7) would be small, isolated tracts, surrounded by State and private lands. They are currently used for livestock grazing and provide wildlife habitat. They would not involve special features such as floodplains, endangered and threatened species, or cultural resources which would warrant keeping them. They would not be encumbered by mining claims or withdrawals. Approximately 10,000 acres of land would be acquired if opportunities become available. These lands contain oil shale and oil and gas and would most likely be acquired through an exchange with the State of Utah. The locations of lands to be acquired or disposed of under this alternative are displayed in Figures 2-7 and 2-22.

## Balanced Use Alternative

### Leasable Minerals

**Oil and Gas.** The BLM favorability and certainty ratings, combined with locations of known geologic structures (KGSs), would be considered before land use allocations are determined (Appendix 4: Specialized Mineral Terminology). Renewable resource values that could require special mitigation (Category 2) include: critical deer, elk, and antelope habitat, sage grouse leks, floodplains and wetlands, severe and critical erosion areas, public water reserves, the Green River from Dinosaur National Monument to Ouray, the White River upstream of the proposed dam, VRM Class II areas, and certain scenic corridors. These areas comprise a total of 413,000 acres.

Renewable resource values precluding surface occupancy (Category 3) would include Boulevard Ridge watershed study area, the White River downstream of the proposed dam, the Green River from Ouray to Tabyago, and 11 key recreational sites. These areas comprise approximately 9,000 acres (Figure 2-23). No areas would be placed in Category 4.

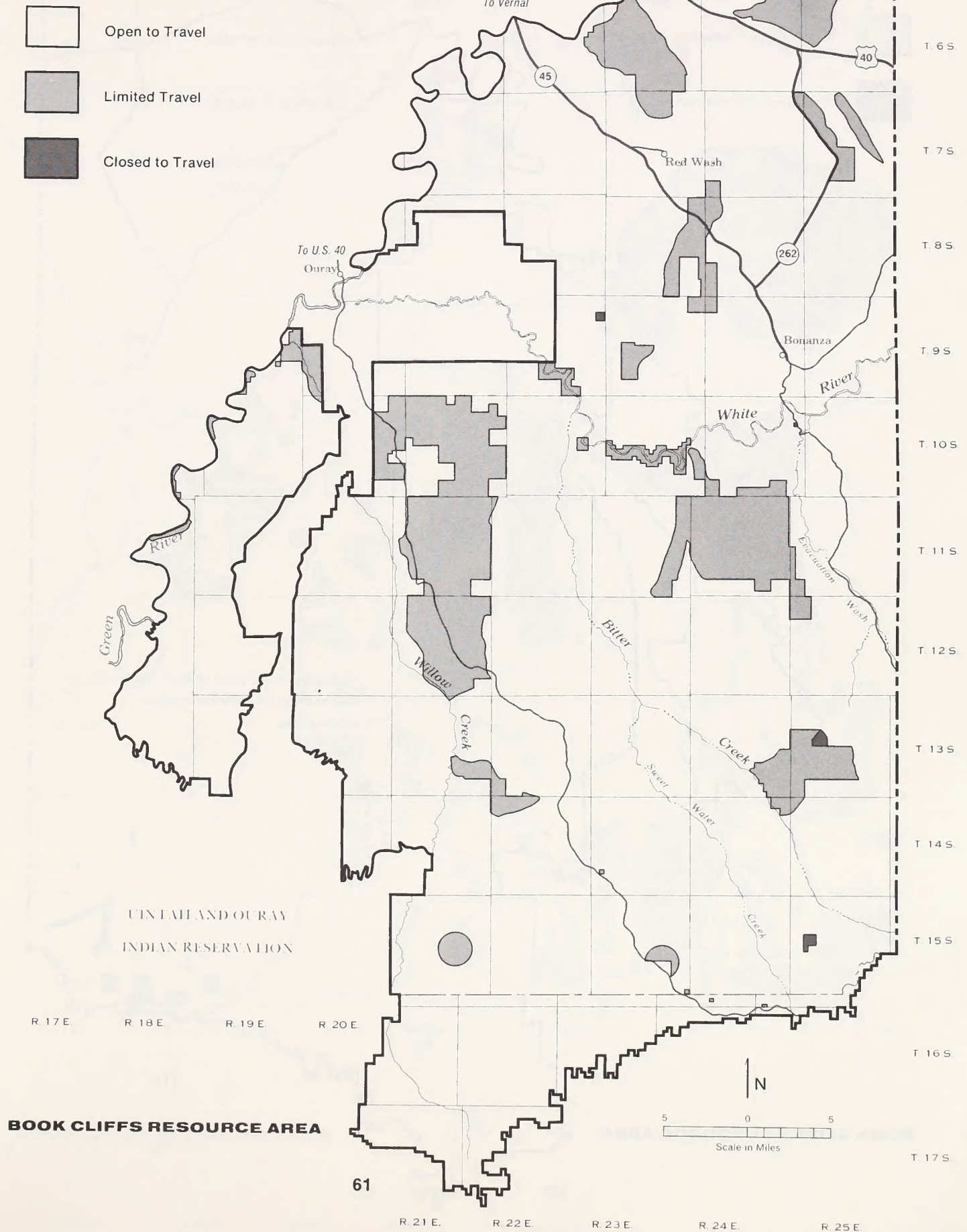
Mitigation for oil and gas leasing would be the same as was discussed under the Current Management Alternative.

**Oil Shale.** Approximately 42,000 acres would be made available for underground mining and 6,000 acres, for in situ development (Figure 2-24). Two to four oil shale tracts consisting of 10,500 to 21,000 acres could be leased within these areas after implementation of the RMP. Additional exploratory drilling would be required on approximately 9,500 acres which are outside of Known Oil Shale Lease Areas before a competitive leasing program would occur.



# OFF-ROAD VEHICLE DESIGNATION (COMMODITY PRODUCTION ALTERNATIVE)

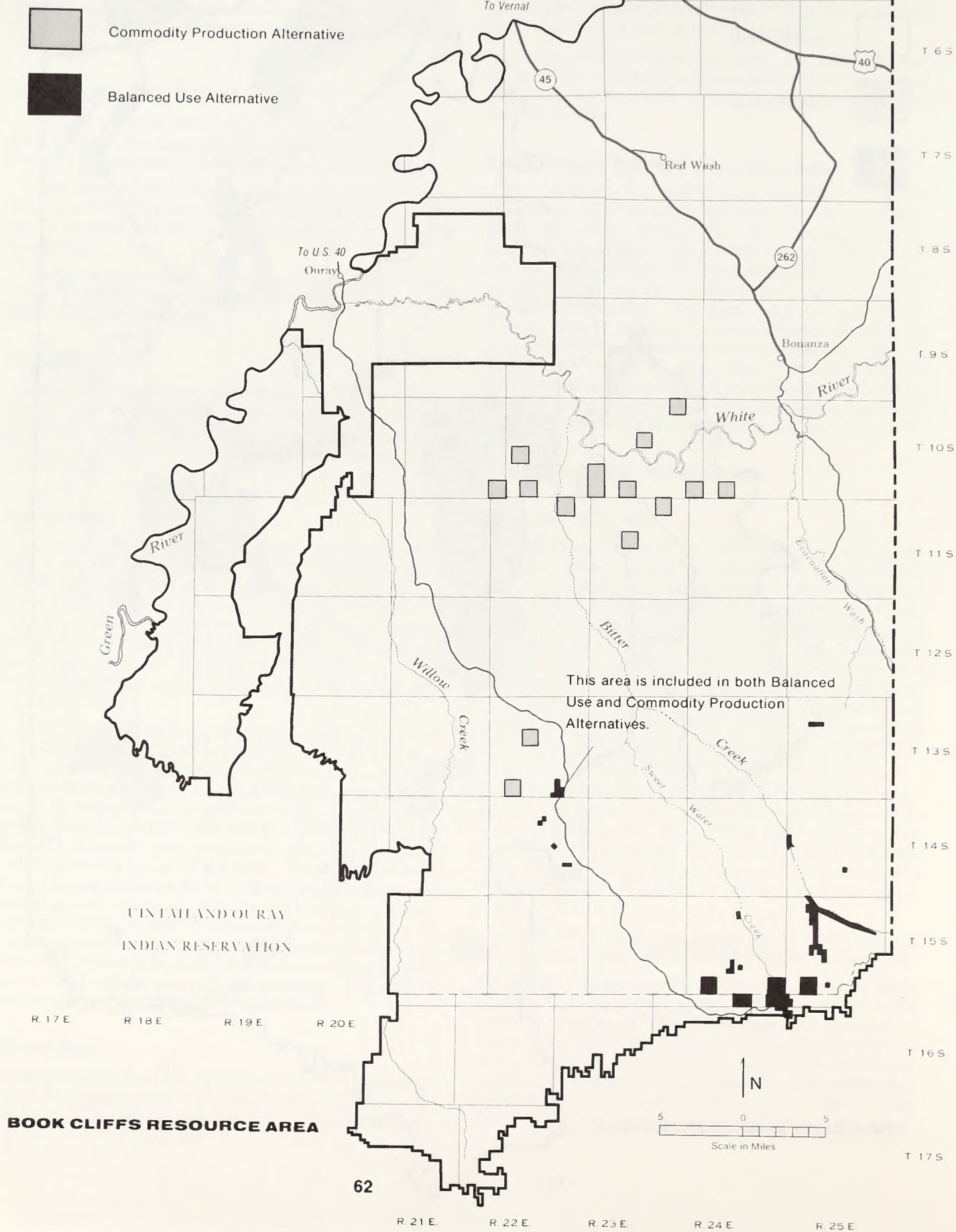
Figure 2 - 21





# POTENTIAL LANDS ACQUISITION FOR BALANCED USE AND COMMODITY PRODUCTION ALTERNATIVES




Figure 2 - 22

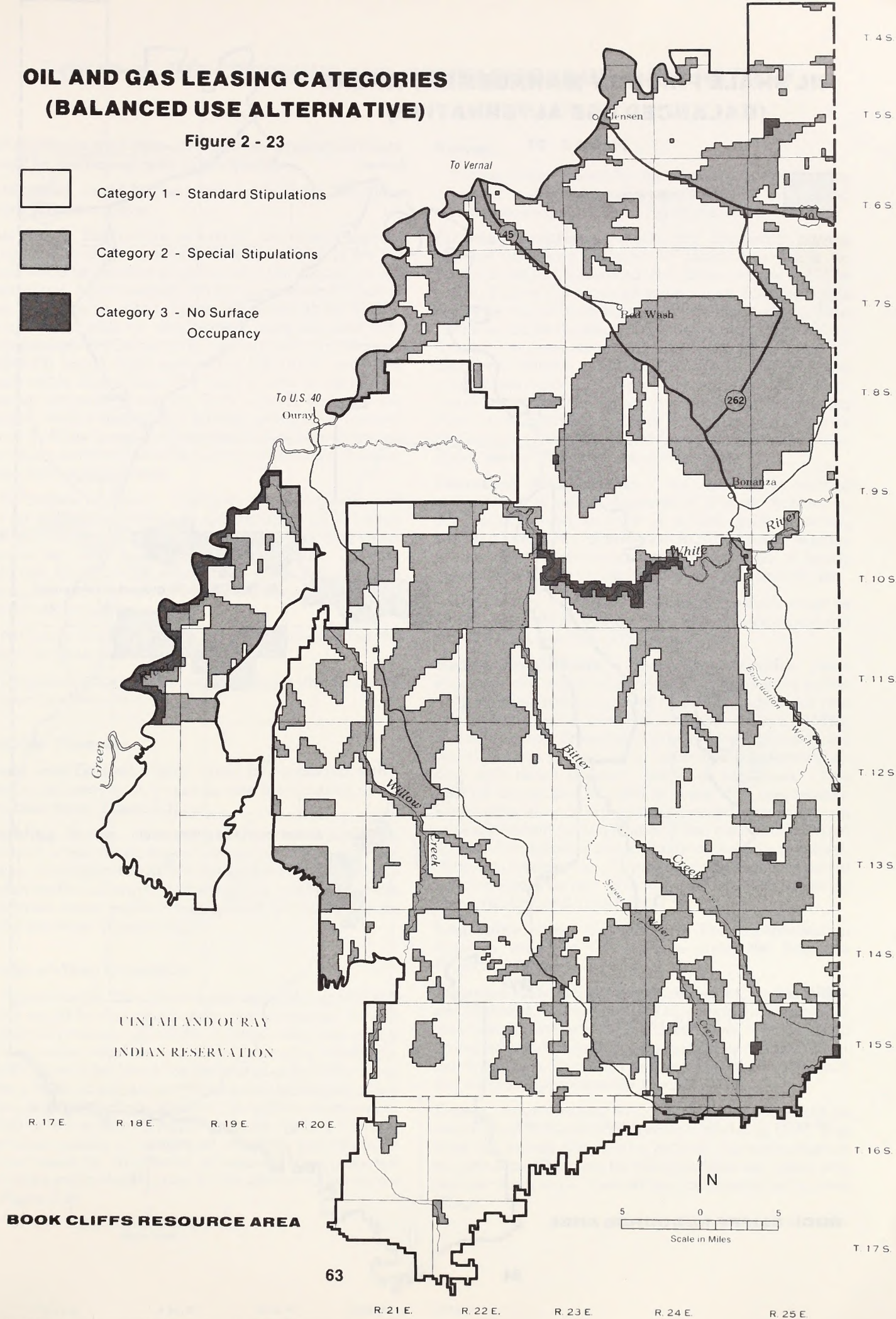




# **OIL AND GAS LEASING CATEGORIES (BALANCED USE ALTERNATIVE)**

**Figure 2 - 23**

-  Category 1 - Standard Stipulations
-  Category 2 - Special Stipulations
-  Category 3 - No Surface Occupancy



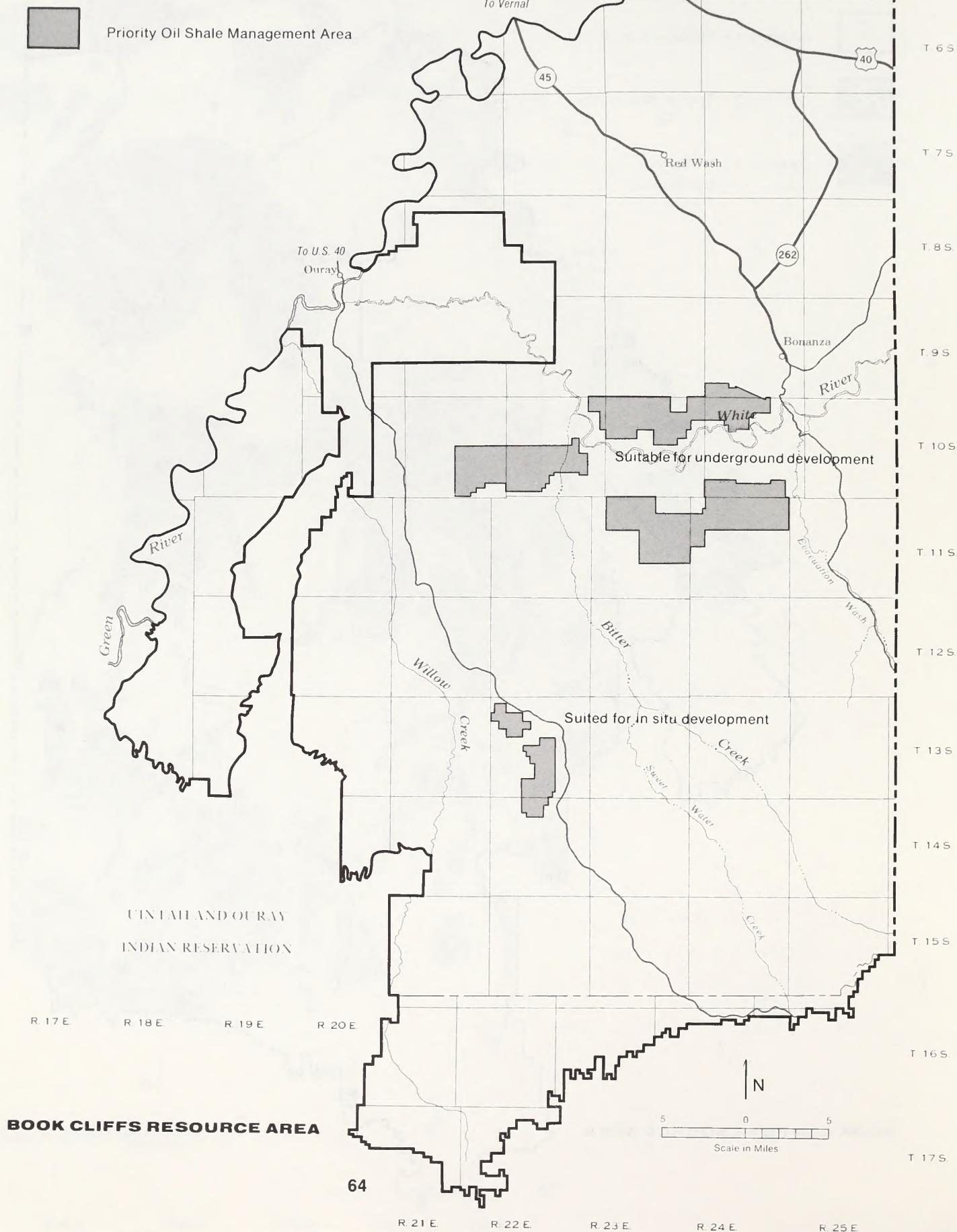


# OIL SHALE PRIORITY MANAGEMENT AREAS (BALANCED USE ALTERNATIVE)

Figure 2 - 24



Priority Oil Shale Management Area





## CHAP. 2 - DESCRIPTIONS AND COMPARISONS OF ALTERNATIVES

Scheduling for tract delineation and size of potential tracts would be determined prior to any leasing.

Mitigation would be the same as under the Resource Protection Alternative.

**Tar Sand.** Expressions of interest, conversion applications, and moderate potential development areas for tar sand would be considered before land use allocations are determined. Approximately 100,000 acres within PR Spring and 10,000 acres within Raven Ridge-Rim Rock STSAs would be available for development using standard mitigating measures (Category 1). Approximately 56,000 acres within PR Spring, 8,000 acres within Hill Creek, and 4,000 acres within Raven Ridge-Rim Rock STSAs would require special mitigation (Category 2) for crucial deer and elk habitat, severe and critical erosion areas, deer fawning areas in Main Canyon, Monument Ridge deer migration corridors, perennial streams, certain VRM Class II areas, and a key recreation area.

No surface occupancy (Category 3) would be required for tar sand development on approximately 27,000 acres within PR Spring STSA for resource values including a sage grouse lek, deer fawning areas east of Main Canyon, McCook Ridge wildlife area, public water reserves, key recreation sites, certain VRM Class II areas, and a watershed study area (Figure 2-25).

No leases would be issued on 12,000 acres within the Naval Oil Shale Reserve.

Mitigation would be the same as under the Resource Protection Alternative.

### Salable Minerals

**Sand and Gravel.** Sales would be conducted within designated areas or on a case-by-case basis outside of the identified areas (Figure 2-3).

**Building Stone.** Current collection areas would be retained while protecting or mitigating other resource values. Approximately 21,500 acres of land currently identified as the Buck Canyon, Johnson Draw, and Nutters Hole collection areas would be designated as building stone collection areas (Figure 2-4).

### Right-of-Way Corridors

Approximately 235 miles of corridors consisting of 93,000 acres would be designated under this alternative. To give additional protection to wildlife habitat, severe and critical erosion areas, visual resources, and productive woodlands, 23,000 acres of land would be designated as exclusion areas where rights-of-way and corridors would be allowed only if adequate mitigation, reclamation, or habitat enhancement could be accomplished. Applications for rights-of-way and corridors outside of designated corridors and exclusion areas would be considered individually. The proposed corridors and exclusion areas for this alternative are shown in Figure 2-26.

### Forage

Forage related actions for this alternative are outlined by allotment in Appendix 5 (Forage Actions by Alternative) and are shown by location in Figure 2-27.

**Grazing Practices.** Under this alternative, grazing systems would be designed to benefit key plants for livestock, wildlife, watershed, etc. Season of use would be adjusted using the balanced use concept. Existing AMPs would be revised to be consistent with balanced use. New AMPs would be developed on most of the "I" allotments. Current management would continue on all "M" and "C" allotments without existing AMPs. Fewer high potential forage areas would be disturbed by energy mineral developments under this alternative than under the Commodity Production Alternative. Fewer restrictions on livestock production would be required under this alternative than under the Resource Protection Alternative.

**Livestock Adjustments.** "Average Use" as outlined under levels of use in Appendix 6 (Forage Actions by Alternative) would be used as a basic guide in setting stocking levels. The difference in AUMs between average use and grazing preference would be sufficient to satisfy other use demands for wildlife, wild horses, minerals, etc.

The number of AUMs authorized for livestock would be 66,887. This is 93 AUMs less than current average use and 36,028 AUMs less than active preference.

**Range Treatments.** Under this alternative, range improvements would be developed to improve the availability of unutilized forage and to develop additional new forage where a potential exists to benefit livestock, wildlife, and wild horses. Prescribed burns or chemical treatment would be used in the canyon bottoms and upland bench sites with dense decadent stands of sagebrush. This method would also be used in areas with over mature stands of browse and in previously chained areas to prevent reinvasion of pinyon and juniper. Clear cuts would be used on sites dominated by closed stands of pinyon and juniper. Mitigating measures for the proposed treatments as part of the proposed action are described in Appendix 8 (Mitigating Measures for Land Treatments).

**Implementation Schedule.** The implementation schedule would be the same as under the Resource Protection Alternative.





**Riparian Habitat, Floodplains, and Crucial Wildlife Habitat.** Approximately 210 acres in the Sweetwater allotment and 260 acres in the Green River AMP would be protected from livestock grazing to improve riparian habitat and floodplains. To restrict the livestock, BLM would build and maintain approximately 10 miles of fence.

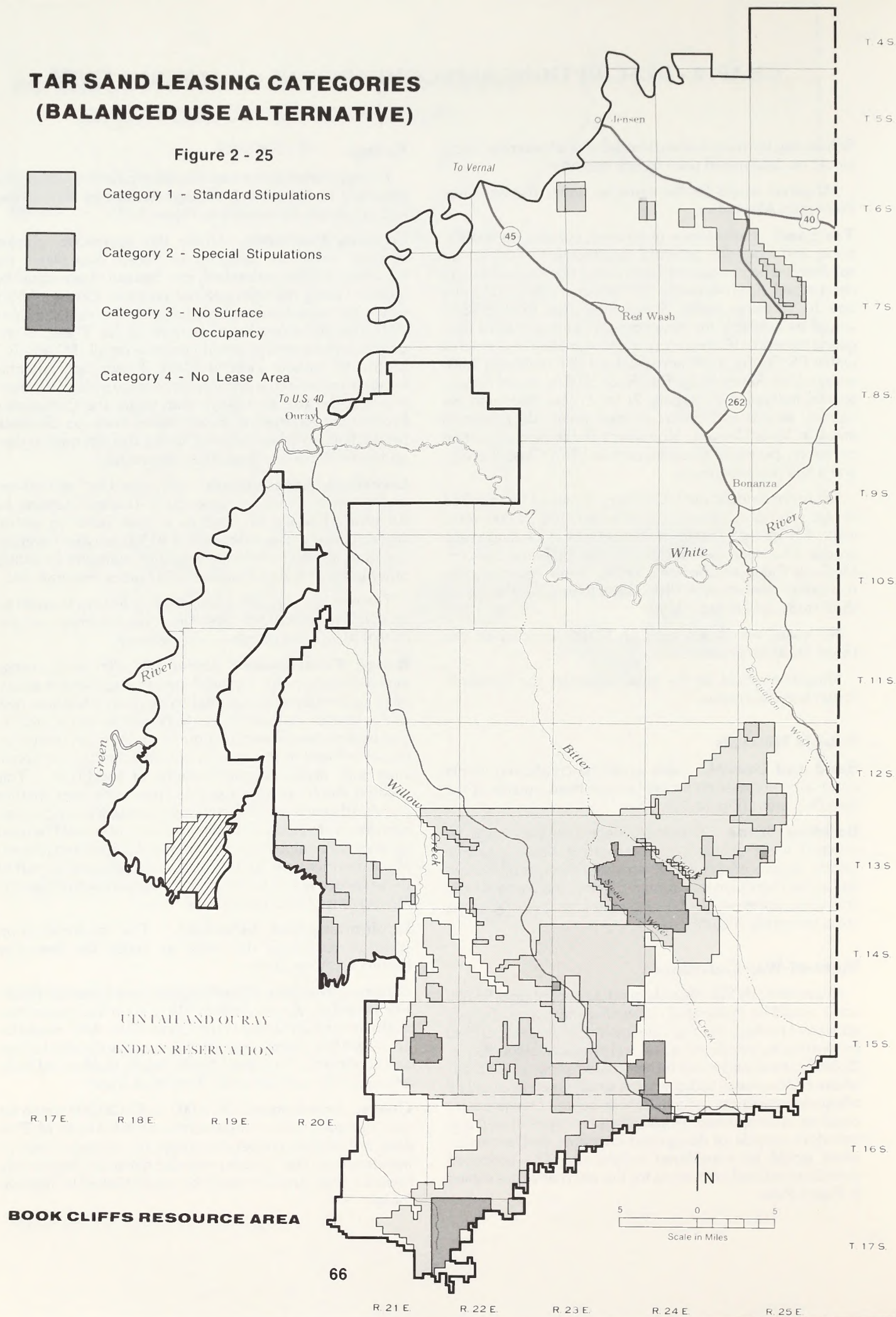
**Costs.** Approximately \$975,000 to \$1,030,000 would be used for new livestock improvements funded by BLM. This does not include cooperative projects, reconstruction or maintenance. The costs for this alternative are higher only because more projects would be accomplished to improve forage.



# TAR SAND LEASING CATEGORIES (BALANCED USE ALTERNATIVE)

Figure 2 - 25

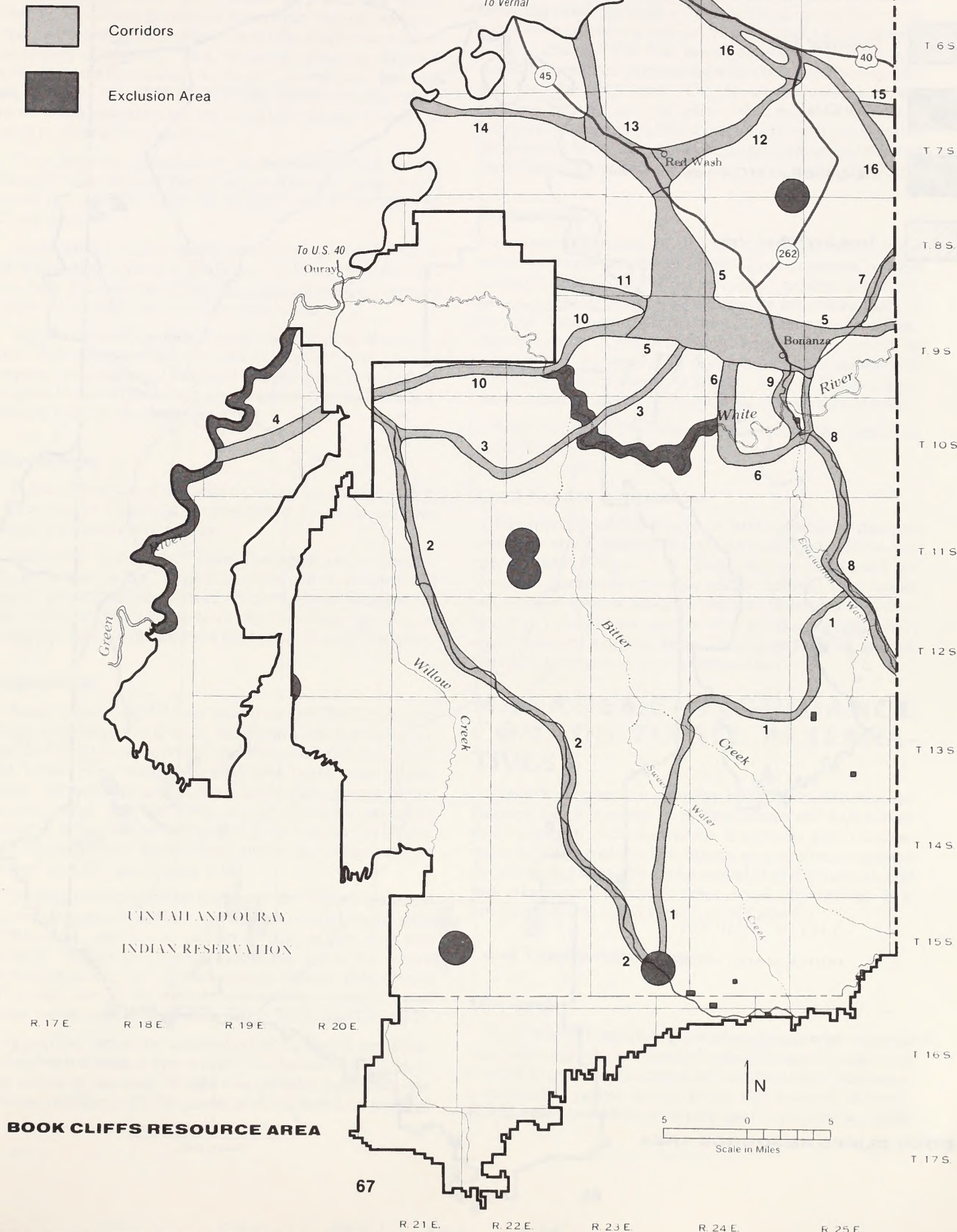
-  Category 1 - Standard Stipulations
-  Category 2 - Special Stipulations
-  Category 3 - No Surface Occupancy
-  Category 4 - No Lease Area





# UTILITY CORRIDORS (BALANCED USE ALTERNATIVE)

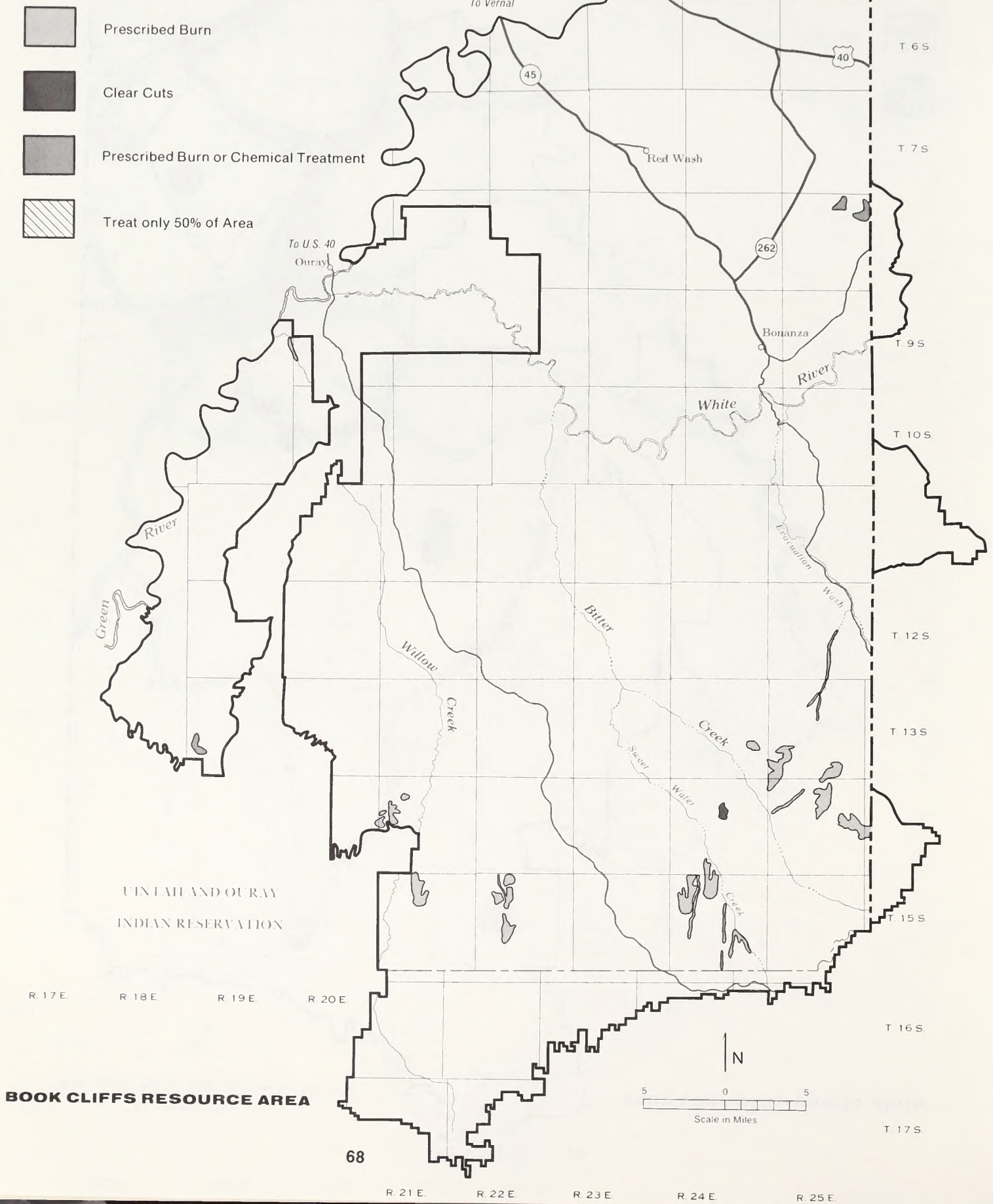
Figure 2 - 26





# **VEGETATIVE TREATMENTS (BALANCED USE ALTERNATIVE)**

Figure 2 - 27





## CHAP. 2 - DESCRIPTIONS AND COMPARISONS OF ALTERNATIVES

### Wildlife and Wild Horses

The approximately 9,000 acres of prescribed burns would concentrate on mature sagebrush canyon bottoms, mature browse stands and old chainings and burns that are becoming overgrown. Two thousand acres of pinyon/-juniper would be chained or clearcut to improve deer and elk forage in crucial winter habitats. Natural regeneration, mechanical reseeding and/or tubeling transplants could be used to reestablish vegetation.

Four habitat management plans, as specified in the Resource Protection Alternative, would be prepared. A wild horse management plan would be prepared for the Hill Creek herd.

Seasonal restrictions on mineral development would be the same as described in the Resource Protection Alternative with the exception that acreages afforded protection under this alternative would be slightly less.

Surface-disturbing activities associated with mineral exploration and development, woodland harvest, etc. would require reclamation. Disturbed wildlife habitat would be required to be returned to a state comparable to that which existed prior to development.

### Woodlands

Public utilization of woodlands would be encouraged in preference to chainings or prescribed burns to improve forage for livestock or wildlife.

Allowable annual cut from managed pinyon-juniper stands would be 3,115 cords per year; from cottonwood stands along the Green River, 70 cords; from Douglas fir, 265 cords; and 820 cords from old chainings, burns, and unproductive woodlands for a total of 4,270 cords per year.

### Recreation

Areas closed to ORV use would include the Boulevard Ridge watershed study area, the Book Cliffs natural area, and the White River corridor from the proposed dam site to the Indian Reservation. Critical wild horse and wildlife areas, recreational and cultural sites, critical and severe erosion areas, and the three scenic corridors would be included in the limited category. Lands next to the Uintah and Ouray Indian Reservation would be designated as limited for ORV use (Figure 2-28).

Existing recreation sites that have the highest potential for development would be retained including five camp sites (320 acres), one scenic overlook (320 acres), and one geologic feature (60 acres). Additional areas for future protection would be: 1) one geologic feature, Duck Rock (10 acres), and 2) the size of the scenic overlook, Point of Pines, would be increased from 320 to 480 acres (Table 2-2).

A corridor would be established along the Green River extending 0.5 miles or line of sight, whichever is closer, from the center of the river. Within this corridor from Tabyago Canyon to Ouray (9,150 acres) and the first four miles of

river below Dinosaur National Monument (320 acres), the placement of structures, developments, or surface disturbance that would degrade scenic quality or recreation values of the river corridor would not be permitted. Developments outside this corridor that would be visible from the river would be designed to minimize impacts to the visual quality standard for that area. The remaining river segment between Ouray and to within four miles of Dinosaur National Monument (4,930 acres) would be afforded partial protection. All developments or surface disturbance would be designed to minimize impacts to visual quality standards.

### Watershed

**Treatment Measures.** Watershed treatment measures would be implemented on 12,300 acres in severe erosion condition and 66,600 acres in critical erosion condition. Acreages are located on 23 allotments with more than 10 percent of their area in severe or critical erosion condition. Approximately 3,900 detention-retention dams would be constructed; however, the exact number and location of structures are not currently known. Refer to Figure 2-6 for the location of severe and critical erosion condition areas.

Mitigation would be the same as under the Resource Protection Alternative.

### Land Tenure Adjustment

The approximately 570 acres of land available for disposal would be small, isolated tracts, surrounded by State and private lands (Figure 2-7). They are currently used for livestock grazing and provide wildlife habitat. They would not contain special features such as floodplains, endangered and threatened species, or cultural resources which would warrant keeping them. They would not be encumbered by mining claims or withdrawals.

## MANAGEMENT GUIDANCE COMMON TO ALL ALTERNATIVES

The following section provides, by program, the management guidance common to all alternatives and thus constitutes a part of each alternative. It includes past management decisions that would continue, proposed management decisions that would be implemented in all alternatives, and procedures and policy common to all alternatives. It is provided here to avoid repetition in Table 2-1.

### Land Tenure Adjustments




#### Disposals

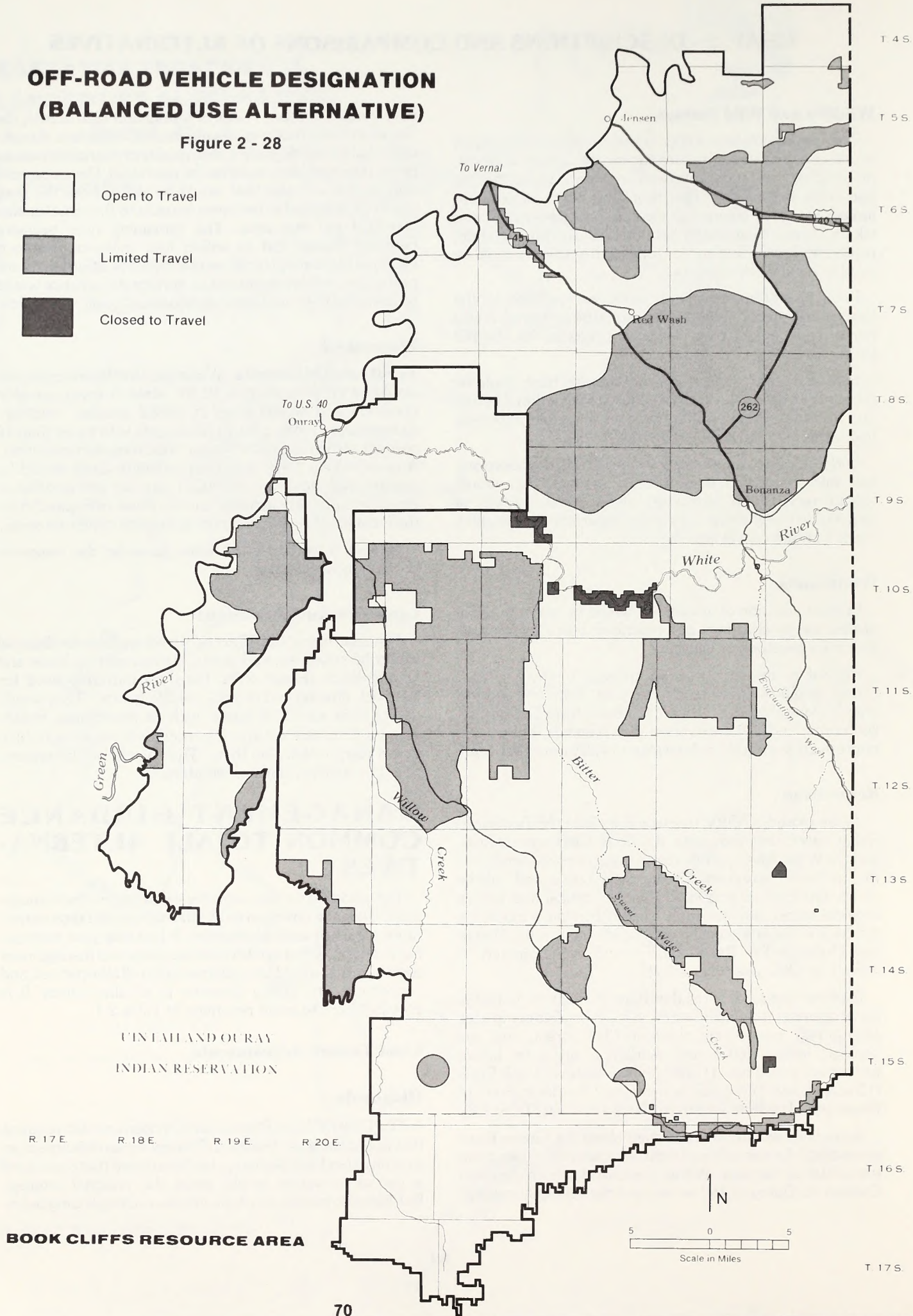
The Federal Land Policy and Management Act requires that public lands be retained in Federal ownership unless, as a result of land use planning, it is determined that disposal of a particular parcel would serve the national interest. FLPMA also provides criteria for use in categorizing public



# OFF-ROAD VEHICLE DESIGNATION (BALANCED USE ALTERNATIVE)

Figure 2 - 28

-  Open to Travel
-  Limited Travel
-  Closed to Travel





## CHAP. 2 - DESCRIPTIONS AND COMPARISONS OF ALTERNATIVES

land for retention or disposal and for identifying acquisition and disposal priorities. All parcels identified within the alternatives meet the basic FLPMA criteria for disposal. All other public lands not identified for disposal would remain in public ownership and be managed by the BLM under its multiple use policy.

Public land, within disposal areas, would be made available for disposal through sales or exchanges although no sales or exchanges would occur without further environmental review. The environmental review would consider several factors when specific adjustment proposals are received. These would include public resource values, including, but not limited to, endangered and threatened and sensitive species habitat, riparian areas, fisheries, nesting/breeding habitat for game animals, key big game seasonal habitat, developed recreation and recreation access sites, visual resource management, watershed, energy and mineral potential, cultural resources, wilderness study areas, statutorily-authorized designations, accessibility of the land for public uses; amount of public investments in facilities or improvements and the potential for recovering those investments; difficulty or cost of administration (manageability); suitability of the land for management by another Federal agency; significance of the decision in stabilizing business, social and economic conditions, and/or lifestyles; encumbrances, including, but not limited to, recreation and public purposes (R & PP) and small tract leases, withdrawals, or other leases or permits, mining claims, consistency of the decision with cooperative agreements and plans or policies of other agencies; and suitability and need for change in land ownership or use for purposes including, but not limited to, community expansion or economic development, such as industrial, residential, or agricultural (other than grazing) development.

### Acquisitions

Land to be acquired by the BLM through exchanges generally must be located in areas identified for retention. In addition, acquisition of such land should meet at least one of the following conditions: 1) facilitate access to public land and resources, 2) maintain or enhance important public values and uses, 3) maintain or enhance local social and economic values, or 4) facilitate implementation of other aspects of this RMP.

### Withdrawal Review

Review of existing withdrawals including reclamation, oil shale, and powersite would be an ongoing process, scheduled to be completed in 1991.

### Rights-of-Way

Types of utilities which could be located within a corridor include electric transmission facilities, pipelines, significant canals, ditches and conduits, railroads, electric communication and microwave sites, communication lines, and highways.

Authorization, including environmental review, of rights-of-way would be handled on a case-by-case basis with approximately 75 to 100 rights-of-way processed annually in the BCRA.

### Land Use Authorizations

Land use authorizations such as agricultural leases would be processed on a case-by-case basis as the need arises. Land use permits for a wide variety of uses would be processed regularly on a case-by-case basis.

### Desert Land Entries

Desert land entries would be processed periodically on a case-by-case basis as the need arises.

### Trespass Abatement

Cases of unauthorized use of public land would be processed as necessary. Highest priority would be given to abatement of the following unauthorized uses: 1) new unauthorized activities or uses where prompt action would minimize damage to public resources and associated costs; 2) cases where delay could be detrimental to authorized users; 3) cases involving special areas, sensitive ecosystems, and resources of national significance; and 4) cases involving malicious or criminal activities.

### Minerals

### Leasable

### Oil and Gas

Administrative and technical capabilities for oil and gas operations have been established in the Vernal District. The following procedures would be continued under the RMP.

Preliminary environmental reviews and notices of staking would be processed at the district and area levels. On-site inspections, processing of needed rights-of-way, and field activities for other requests or permits would be administered at the area level.

Applications for permits to drill (APD), sundry notices, other applications to perform work, and compliance reports would be processed at both the district and area levels. On-site inspections, environmental review, determinations, conditions of approval, and other aspects of the processing of APDs and sundry notices would be handled at the district and area levels.

Drainage determinations and delineation of KGSs would be handled at the state and district levels.

Future oil and gas activities would continue to be subject to further environmental review. Special stipulations for protection of renewable resource values would be developed through an activity plan and attached to future oil and gas leases.



## CHAP. 2 - DESCRIPTIONS AND COMPARISONS OF ALTERNATIVES

### Tar Sand

Administrative and technical capabilities for managing tar sand operations are presently at the Utah State Office although these responsibilities could be delegated in the future to the Vernal District.

Tar sand development would be managed in accordance with the 43 CFR 3140 regulations which would require a detailed development plan as outlined in 43 CFR 3570. These regulations promote orderly prospecting, exploration, testing, development, mining and processing operations and require operating procedures which would avoid, minimize, or correct damage to the environment.

Combined hydrocarbon leases could be obtained in two possible ways. Prior to November 16, 1983, existing oil and gas leases in Special Tar Sand Areas (STSA) could be converted to a combined hydrocarbon lease (CHL). An approved CHL would provide the leaseholder the opportunity to develop either oil and gas and/or the tar sand resource. Applications to convert existing oil and gas leases to CHLs within the BCRA totaled approximately 35,000 acres within PR Spring STSA, 4,000 acres within Hill Creek STSA, and 800 acres within Raven Ridge-Rim Rock STSA. A second method would be through a competitive leasing program. No schedule to offer tracts for competitive lease has been developed.

Site specific environmental documents would be prepared prior to any development.

Combined hydrocarbon leases would be issued using one category system. Oil and gas categories have been separated from tar sand categories in this document to clarify which type of energy mineral resource development may result in the final constraints placed upon lease development (Appendix 4, Specialized Mineral Terminology).

### Oil Shale

Lease administration of U-a and U-b (White River Shale) including all technical review and compliance would be handled through the BLM Oil Shale Office in Grand Junction, Colorado. These responsibilities could be delegated in the future to the Vernal District Office.

The oil shale program for future leasing is currently being developed with environmental, industry, and governmental input. The procedures and policies would probably involve tract delineation; environmental review; a competitive lease program, including local and state government input; and a lessee's submittal of a detailed development plan (43 CFR 3570). These plans would provide detailed information concerning all aspects of mining and development along with detailed measures for protection of the environment. They would be subject to BLM approval.

### Gilsonite

Gilsonite leases would be handled through the Utah State

Office although these responsibilities could be delegated to the Vernal District in the future.

Future gilsonite leasing would be made through a competitive leasing program. Lease approval would require submittal of an acceptable mining and reclamation plan subject to environmental review prior to any development.

### Locatable Minerals

The general mining law of 1872 (17 Stat. 91) authorized placer and lode mining claims to be located by a procedure that is largely unchanged to this day. In 1930, it became apparent that mining claims located in lands considered valuable for oil shale posed a potential encumbrance against future oil shale development. Subsequently, lands considered valuable for oil shale were withdrawn from appropriation under the general mining laws. Approximately 75 percent of the BCRA remains under an oil shale withdrawal and is not open to entry.

Mineral exploration and development would be regulated in accordance with the 43 CFR 2809 regulations. These regulations apply to mining activities from claims made under the authority of the 1872 mining law, as amended. These regulations establish procedures to prevent unnecessary or undue degradation of public lands. A notice giving a description of the operation and a reclamation plan would be required for disturbances of five acres or less per year. A detailed plan of operations, including a reclamation plan would be required for disturbances of more than five acres per year or in areas closed to ORV use. Environmental assessments would be prepared in response to all plans of operations. Environmental review, approval of plans, and compliance would be administered at the area level.

### Salable Minerals

#### Sand and Gravel

Environmental review would be required prior to any development with sales and compliance administered at the area level.

#### Building Stone

Building stone would be sold in accordance with an activity plan developed following the RMP.

### Recreation

Dispersed recreation opportunities, where visitors would have freedom of recreational choice with minimal regulatory constraints, would continue to be provided for the public. Recreation facilities receiving the heaviest use would receive first priority for maintenance funds. Investment of public funds for new recreation developments would be permitted only on land identified for retention in public ownership, where demand for such sites is high and where



## CHAP. 2 - DESCRIPTIONS AND COMPARISONS OF ALTERNATIVES

recreation objectives would not be attained without development.

The basic management objective for recreation management shall be to provide for unstructured recreation activities, to be managed under the Bureau's basic stewardship responsibilities.

### Off-Road Vehicle Use (ORV)

It is BLM policy that planning for ORV use is an integral part of the planning system with decisions to designate Federal lands as either "open", "closed", or "limited" for vehicle use. After selection of off-road vehicle designations in the Final RMP, an Off-road Vehicle Implementation Plan would be developed within one year of the Final RMP if funding is available.

### Wildlife

Impacts to fish and wildlife habitat would continue to be evaluated on a case-by-case basis as a part of project level planning. Such evaluation would consider the significance of the proposed project and the sensitivity of fish and wildlife habitat in the affected area. Mitigations would be attached as appropriate to assure compatibility of projects with management objectives for fish and wildlife habitat. Habitat improvement projects would be implemented where necessary to stabilize and/or improve unsatisfactory or declining wildlife habitat condition.

Habitat Management Plans (HMPs) would be prepared upon approval of the Final RMP. The HMPs would be prepared for each wildlife herd unit in accord with the wildlife management actions to be implemented under the selected alternative. Where circumstances warrant, wildlife habitat work and related fund expenditures could proceed independently upon approval of the State Director. However, where applicable, HMPs and AMPs would normally be coordinated in preparation and implementation to the fullest extent possible to avoid duplication of effort and undue costs.

### Endangered, Threatened, and Sensitive Habitat

No activities would be permitted in habitat for endangered or threatened species that would jeopardize the continued existence of such species.

Whenever possible, management activities in habitat for endangered, threatened, or sensitive species would be designed to benefit those species through habitat improvement.

The BLM would complete either a clearance (minor actions and projects) or a biological assessment (major actions and projects requiring an EIS) for endangered or threatened species before implementing projects. Any project or action that could affect an endangered or threatened species or its habitat would be determined

through the clearance or biological assessment process and would require a consultation with the U.S. Fish and Wildlife Service as required by Section 7 of the Endangered Species Act of 1973 as amended.

### Big Game and Upland Game Habitat

Sufficient forage and cover would be provided for wildlife populations on seasonal habitat.

Rangeland improvements generally would be designed to benefit or accommodate both wildlife and livestock. Vegetation manipulation projects would be designed to minimize damage to and improve wildlife habitat. Existing fences could be modified, and new fences would be built to allow wildlife passage. Water would be provided, where practical, in allotments (including rested pastures) during seasonal periods of need for wildlife.

### Riparian/Fisheries Habitat

Management actions within floodplains and wetlands would include measures to preserve, protect, and if necessary, restore their natural functions (as required by Executive Orders 11988 and 11990). Management techniques would be used to minimize the degradation of stream banks and the loss of riparian vegetation.

Management activities in riparian zones, including mitigating surface disturbing activities, would be designed to maintain or, where possible, improve riparian habitat condition.

### Soils, Water, and Air

Soil, water, and air resources would continue to be evaluated on a case-by-case basis on non-Bureau initiated projects and in project level planning. Such an evaluation would consider the significance of the proposed project and the sensitivity of soil, water, and air resources in the affected area. Stipulations would be attached as appropriate to ensure compatibility of projects with soil, water, and air resource management.

Watershed Management Plans (WMPs) would be prepared upon approval of the Final RMP. The WMPs would usually be prepared for a geographical area with similar watershed problems and outline specific actions to be implemented in achieving specific objectives. Watershed expenditures could also be made in areas of approved AMPs and HMPs where specific actions are identified to solve watershed problems.

Soils would be managed to maintain productivity and to minimize erosion. Management techniques that could be used to maintain soil productivity and minimize soil erosion include treatments designed to increase vegetation cover and gully plugs to reduce head cutting.

On projects that may significantly affect water quality, consultation with State of Utah agencies would be made to assure protection of existing water quality, consistent with



## CHAP. 2 - DESCRIPTIONS AND COMPARISONS OF ALTERNATIVES

the Colorado River Basin Salinity Control Act and state water quality standards for stream segments within the BCRA. Water quality monitoring would be undertaken by BLM or required of project sponsors to assure compliance.

### Forestry

Fuelwood, cedar posts and other woodland products would be available for harvest by the public from the public lands. As a general rule, charges would be made for these products. Free use could be authorized on lands where the material has no market value and demand is small. Stipulations designed to protect visual resources, wildlife habitat, and other resource values would be attached to permits at time of sale.

Upon approval of the RMP, woodland management plans would be prepared outlining specific actions to be implemented to achieve objectives. Specific actions such as establishment of green wood cutting areas, access needs, estimation of products to be harvested, signing needs, etc., would be identified in the activity plan phase.

### Allotment Categorization

All allotments have been placed in one of three basic management categories: [Improvement (I), Maintenance (M), Custodial (C)], based primarily on current resource conditions and potential for improvement [specific criteria for categorization of allotments are outlined in Appendix 3 (Allotment Management Category Criteria)]. "I" category allotments are those having a need and potential for "improvement" thru management, "M" category allotments are those to be managed to "maintain" current satisfactory conditions, and "C" category allotments are those to be managed on a "custodial" basis to prevent resource deterioration.

The same basic categorization criteria and ratings for the respective allotments are used for each of the alternatives. Under each alternative, the process is dynamic, i.e. the ratings would be subject to change as management practices or other factors alter the category into which the respective allotments would fall.

Under all alternatives, initial categorization would be 25 "I" allotments, 18 "M" allotments, and 11 "C" allotments.

### Allotment Management Plans

Allotment management plans are commonly used to present, in detail, the types of changes required in an allotment, and to establish a schedule for implementation. Actions set forth under the allotment management plans that affect the environment would be analyzed prior to their implementation. The proposal, however, may be altered to mitigate adverse impacts in the future. The priorities for completing AMPs would be in line with the allotment categorization process.

### Stocking Levels and Adjustments

In reviewing the target stocking level figures and other recommended changes, it is emphasized that the target AUM figures are not final stocking levels. Rather, all livestock use adjustments would be implemented through documented mutual agreement or by decision. When adjustments would be made through mutual agreement, they could be implemented once the Rangeland Program Summary has been issued (subject to a 30-day protest period). When livestock use adjustments would be implemented by decision, it would be based on operator consultation and monitoring of resource conditions. Current BLM policy emphasizes the use of a systematic monitoring program to determine the need for livestock adjustments.

The Federal regulations that govern changes in allocation of livestock forage provide specific direction for livestock use adjustments implemented by decision (43 CFR 4110.3-1 and 43 CFR 4110.32). The regulations specify that permanent increases in livestock forage "shall be implemented over a period not to exceed 5 years...", and that decreases in livestock forage "shall be implemented over a 5-year period...". The regulations do provide for decreases to be implemented in less than 5 years when 1) the downward adjustment is 15 percent or less of the "authorized active grazing use for the previous year", 2) an agreement is reached to implement the adjustment in less than 5 years, or 3) a shorter implementation period is needed to sustain resource productivity.

### Monitoring

The "Five Year Implementation and Monitoring Program", required by current range policy to determine proper stocking levels for livestock grazing, would be completed by September 1989.

Monitoring activities to determine the effect of the various management practices on the soil and vegetative resource will be carried out for all alternatives. The same basic procedures will be followed. However, the frequency, intensity, and particular kind of studies will vary between alternatives. For instance, under the Current Management Alternative, emphasis would be placed on the "I" allotments, which have resource problems. "M" and "C" allotments would also be monitored but commensurate with district capabilities. Under the Resource Protection Alternative, emphasis would be placed on wildlife, watershed, and wild horse aspects. The kind of study and area of concentration would vary accordingly. Under the Commodity Production Alternative, emphasis would be placed on maximizing livestock production. Under the Balanced Use Alternative, emphasis would be similar to the Current Management Alternative.

### Allotment Evaluation Program

Periodically, each allotment will be evaluated with respect to resource conditions, management practices, and facili-



## CHAP. 2 - DESCRIPTIONS AND COMPARISONS OF ALTERNATIVES

ties. The evaluation will involve an analysis of monitoring data including climatological data. It may also include range inspection tours by BLM and affected users to jointly evaluate on-the-ground conditions. Any necessary adjustments in stocking levels or other management practices including changes or additions to existing management facilities would be based on the allotment evaluation.

The frequency and intensity of evaluations would be commensurate with resource values and use level conflicts relative to the "M", "I", or "C" category assigned to the allotment.

### Cost Estimates

Under all alternatives, range improvement costs are based on district averages as depicted below (BLM 1984):

Reservoirs	\$ 2,000 each
Seeps or Springs	\$ 3,000 each
Guzzlers	\$20,000 each
Pipelines	\$10,500 per mile
Fence	\$ 4,000 per mile
Prescribed Burn	\$3.00-\$4.00 per acre
PJ Chaining	\$25.00 to \$35.00 per acre
Sagebrush Spraying	\$12.00 per acre
Clear Cuts (Cost absorbed by sale of woodland products)	

### Cultural and Paleontological Resources

Cultural and paleontological resources would continue to be inventoried and evaluated as part of project level planning and non-Bureau initiated actions. Such evaluation would consider the significance of the proposed projects and the sensitivity of resources in the affected area. Mitigation would be attached to project approvals as appropriate to assure compatibility of projects with management objectives for cultural and paleontological resources. For example, if a cultural site is located during construction operations, the operator would be required to cease work in that area and notify the appropriate agency official. Upon determination of significance, and if necessary, salvage/avoidance would be deemed appropriate through consultation between the State Historic Preservation Office (SHPO) and the BLM. The operator could continue work near the affected area. If the site is determined to be non-significant, the operator could continue without any mitigation to the site.

The objective of the BLM cultural resource program is to manage cultural resources in a stewardship role for public benefit. The Department of the Interior has issued instructions and regulations concerning management of cultural resources. The purposes of the system are to analyze the specific values of cultural resources, to incorporate cultural resources into the planning system, and to identify cultural resource information needs when existing documentation is inadequate to support land use decision making. The Bureau would evaluate sites, areas, and structures on a case-by-case basis as to their eligibility for inclusion into the National Register of Historic Sites.

### Visual Resources

Visual resources would continue to be evaluated as a part of activity and project planning. Such evaluation would consider the significance of the proposed project and the visual sensitivity of the affected area. Stipulations would be attached as appropriate to attain compatibility of projects with management objectives for visual resources.

### GENERAL SUPPORT NEEDS

The approval of the RMP is only the first step in the planning process. The RMP does not represent the final implementation plan for decisions, although site specific actions are identified in an RMP. The activity and project planning phase generally provides the guidance on implementing decisions, actions, cost phasing, scheduling, maintenance, and monitoring, involving areas where extensive capital expenditures are required. Program specific activity plans (i.e., Allotment Management Plans, Habitat Management Plans, Watershed Management Plans) would be prepared following the final decisions made for the RMP. When several program priorities require activity plans in a common geographic area, a coordinated activity plan would be prepared. The final step is plan implementation, including appropriate mitigation. Maintenance of any improvements would be continued as directed in the appropriate plans.

### ACTIONS WHICH WOULD OCCUR REGARDLESS OF THE ALTERNATIVE SELECTED

Most of the management concerns discussed in Chapter 1 involve administrative decisions which will be the same, regardless of the alternative that is selected for this RMP. These concerns include: leasing of public lands for support facilities; administration of NOSR II; retention or revocation of oil shale; reclamation and power site withdrawals; and leasing of geothermal steam. The impacts that would result to the environment would not be significant based upon current information; however, additional environmental documentation would be prepared when specific proposals are developed for these concerns. No additional discussion of these concerns appears in this text.

Two management concerns, management of the Boulevard Ridge Watershed Study Area and the Book Cliffs Mountain Browse Natural Area, were included in the alternative analysis.

### SUMMARY OF ENVIRONMENTAL CONSEQUENCES

Table 2-3 presents the environmental consequences of the actions for each alternative. The table is not complete and merely highlights the impacts discussed in more detail in Chapter 4.



TABLE 2-3  
SUMMARY OF ENVIRONMENTAL CONSEQUENCES

RESOURCE	CURRENT MANAGEMENT	RESOURCE PROTECTION	COMMODITY PRODUCTION	BALANCED USE
MINERALS				
Oil & Gas	Development of oil and gas in the Winter Ridge Wilderness Study Area (WSA) would be delayed until determined by Congress.	No WSA conflict.	No WSA conflict.	No WSA conflict.
	No oil shale conflicts.	Oil shale mining could damage or destroy oil and gas developments.	Oil shale mining could damage or destroy oil and gas developments.	Oil shale mining could damage or destroy oil and gas developments.
Oil Shale	Additional oil shale development would be delayed.	Eighteen thousand-acre priority management area could limit flexibility in locating two tracts.	No effects to oil shale development.	No effects to oil shale development.
		In situ development would be delayed.		
Tar Sand	Development of tar sand in the Winter Ridge WSA would be delayed until determination by Congress.	No WSA conflict.	No WSA conflict.	No WSA conflict.
Gilsonite	No effects.	Some veins lost to oil shale development.	Some veins lost to oil shale development.	Some veins lost to oil shale development.



RESOURCE	CURRENT MANAGEMENT	RESOURCE PROTECTION	COMMODITY PRODUCTION	BALANCED USE
Sand and Gravel	No effects.	No effects.	No effects.	No effects.
Building Stone	No effects.	No effects.	Stone on 1,000 acres could be lost to in situ oil shale development.	Stone on 1,000 acres could be lost to in situ oil shale development.
TRANSPORTATION UTILITY CORRIDORS	Possible resource conflicts on 61,500 acres within proposed corridors.	Possible resource conflicts on 46,000 acres within proposed corridors.	Possible resource conflicts on 174,000 acres within proposed corridors.	Possible resource conflicts on 93,000 acres within proposed corridors.
FORAGE	Ecological condition would improve on 497 acres in 12 allotments, remain unchanged on 496,600 acres in 35 allotments, and decline on 38,600 acres in 7 allotments.	Ecological condition would improve on 1,086,600 acres in 49 allotments and remain unchanged on 168,600 acres in 5 allotments.	Ecological condition would improve on 642,300 acres in 30 allotments and remain unchanged on 472,900 acres in 24 allotments.	Ecological condition would improve on 846,900 acres in 37 allotments and remain unchanged on 266,500 acres in 17 allotments.
	Livestock would be authorized 102,581 AUMs (no change from active preference), wildlife would be authorized 43,638 AUMs (no change from allocated use), and wild horses would not be authorized any forage.	Livestock would be authorized 49,208 AUMs (48 percent) below active preference, wildlife would be authorized 11,959 AUMs (27 percent) above allocated use, and wild horses would be authorized 2,940 AUMs above the current allocated level of 0.	Livestock would be authorized an additional 6,934 AUMs (7 percent) above active preference, wildlife would be authorized 26,351 fewer AUMs (a 60 percent decrease) below allocated use, and wild horses would be authorized 710 AUMs above the current allocated level of 0.	Livestock would be authorized 35,420 AUMs (35 percent) below active preference, wildlife would be authorized 3,958 AUMs (9 percent) above allocated use, and wild horses would be authorized 2,340 AUMs above the current allocated level of 0.



RESOURCE	CURRENT MANAGEMENT	RESOURCE PROTECTION	COMMODITY PRODUCTION	BALANCED USE
FORAGE (CONT.)	Approximately 576 AUMs would be lost to mineral development and no AUMs would be gained from land treatments.	Approximately 1,181 AUMs would be lost to mineral development and 1,708 AUMs would be gained from land treatments.	Approximately 3,856 AUMs would be lost to mineral development and 2,700 AUMs would be gained from land treatments.	Approximately 1,858 AUMs would be lost to mineral development and 2,034 AUMs would be gained from land treatments.
WILDLIFE WILD HORSES	No significant effects on wildlife or wild horse forage.	Additional forage available for wildlife and wild horses would allow the following increases: antelope: 503 mule deer: 12,100 elk: 1,800 wild horses: 39	Reduced forage for wildlife would result in the following decreases: antelope: 309 mule deer: 400 elk: no change wild horses: 146	Additional forage for wildlife would allow the following increases: antelope: 189 to 289 mule deer: 7,800 to 9,800 elk: 1,300 to 1,400 Reduced forage for wild horses would result in a decrease of 6 horses.
	No significant changes to habitat.	Significant habitat improvements due to livestock decreases.	Significant habitat losses due to mineral development.	Overall habitat improvement in spite of losses to mineral development.
	No effects on endangered fish species.	Water depletions from the White River could affect two endangered fish species.	Water depletions from the White River would affect two endangered fish species.	Water depletions from the White River could affect two endangered fish species.



RESOURCE	CURRENT MANAGEMENT	RESOURCE PROTECTION	COMMODITY PRODUCTION	BALANCED USE
WOODLANDS	Approximately 220 acres of woodlands could be eliminated annually, due to overharvest.	One thousand, seven hundred acres of woodlands lost to mineral development, rights-of-way and fire.	Twenty thousand, three hundred and eighty acres of woodlands lost to mineral development, rights-of-way and fire.	Five thousand, one hundred and fifty acres of woodlands lost to mineral development, rights-of-way and fire.
		Twelve thousand, eight hundred acres unavailable for harvest to protect other resources.	Twenty acres unavailable for harvest to protect other resources.	Four thousand, seven hundred and fifty acres unavailable for harvest to protect other resources.
RECREATION	Population increases would result in increased demand for big game hunting by 400 visitor days.	Population increases and increased big game populations would result in increased demand for big game hunting by 4,060 visitor days.	Population increases would result in increased demand for big game hunting by 1,560 visitor days.	Population increases and increased big game populations would result in increased demand for big game hunting by 3,350 visitor days.
	No significant increase in the demand for other recreational activities.	Demand for other recreational activities would increase by 2,700 visitor days.	Demand for other recreational activities would increase by 5,900 visitor days.	Demand for other recreational activities would increase by 4,700 visitor days.
	Musket Shot Springs Overlook maintained.	Musket Shot Springs Overlook maintained.	Musket Shot Springs Overlook eliminated.	Musket Shot Springs Overlook eliminated.



RESOURCE	CURRENT MANAGEMENT	RESOURCE PROTECTION	COMMODITY PRODUCTION	BALANCED USE
RECREATION (CONT.)	No significant effect to visual resources.	Construction in designated corridors could adversely affect visual resources on 4,640 acres.	Construction in designated corridors could adversely affect visual resources on 13,400 acres.	Construction in designated corridors could adversely affect visual resources on 6,400 acres.
	Undesignated ORV use could be inconsistent with Ute tribal plans for Hill Creek Extension.	ORV designations consistent with Ute tribal plans for Hill Creek Extension.	ORV designations inconsistent with Ute tribal plans for Hill Creek Extension.	ORV designations consistent with Ute tribal plans for Hill Creek Extension.
	No effects to ORV use.	Five hundred and seventy-five ORV user days would be lost to closures and restrictions.	Two hundred ORV user days would be lost to closures and restrictions.	Five hundred ORV user days would be lost to closures and restrictions.
FIRE MANAGEMENT	No effects to canoeing.	No effects to canoeing.	Water depletions from the White River would result in marginal canoeing opportunities.	Water depletions from the White River could result in marginal canoeing opportunities.
	Livestock forage and wildlife habitat would improve on 5,000 to 10,000 acres.	Wildlife habitat would improve on 15,000 acres.	Livestock forage would increase and wildlife habitat would diminish on 13,000 to 28,500 acres.	Livestock and wildlife forage would increase and wildlife habitat would improve on 17,000 to 27,900 acres.



RESOURCE	CURRENT MANAGEMENT	RESOURCE PROTECTION	COMMODITY PRODUCTION	BALANCED USE
WATERSHED	No effect on water quality.	Diverting an additional 28,000 acre-feet from the White River for oil shale development would increase TDS concentrations at Imperial Dam by 1 mg/l.	Diverting an additional 56,000 acre-feet from the White River for oil shale development would increase TDS concentrations at Imperial Dam by 2 mg/l.	Diverting an additional 28,000 to 56,000 acre-feet from the White River for oil shale development would increase TDS concentrations at Imperial Dam by 1 to 2 mg/l.
	Watershed treatments would reduce soil loss by 64,000 tons.	Watershed treatments would reduce soil loss by 711,000 tons.	Watershed treatments would reduce soil loss by 41,000 tons.	Watershed treatments would reduce soil loss by 505,000 tons.
	No significant effect on soil loss.	An additional 10,700 to 20,600 tons of soil would be lost to mineral development.	An additional 47,300 to 83,200 tons of soil would be lost to mineral development.	An additional 17,700 to 36,500 tons of soil would be lost to mineral development.
	No significant effect on floodplains.	Unquantifiable improvement to floodplains by limiting or restricting livestock and ORV use and mineral development.	No significant effect on floodplains.	Unquantifiable improvement to floodplains by limiting or restricting livestock and ORV use and mineral development.



RESOURCE	CURRENT MANAGEMENT	RESOURCE PROTECTION	COMMODITY PRODUCTION	BALANCED USE
LAND ADMINISTRATION	No effect on land administra- tion.	Acquisition of up to 5,660 acres of riparian and wild- life habitat would enhance the wild- life program.	Acquisition of up to 10,000 acres of tar sand and oil shale areas would enhance the minerals program.	Acquisition of up to 5,800 acres of riparian and wild- life habitat and potential recrea- tion sites would enhance the wild- life and recreation programs.
AIR QUALITY	No significant effect on air quality.	NAAQS and Class II standards for TSP could be exceeded near mines and haul roads.	NAAQS and Class II standards for TSP would be exceeded. Visible discolora- tion would occur to the Uintah and Ouray Indian Reservation. Discoloration could occur to the Dino- saur and Colorado National Monuments.	NAAQS and Class II standards for TSP would be exceeded. Visible discolora- tion could occur to Dinosaur National Monument and the Uintah and Ouray Indian Reservation.
CULTURAL RESOURCES/ PALEONTOLOGY	No significant effects.	No significant effects.	No significant effects.	No significant effects.
SOCIO-ECONOMICS	No significant changes to the economy, popula- tion, or community infrastructure.	Mineral development would increase regional employment and income an unknown amount.	Mineral development would increase regional employment and income by an unknown amount.	Mineral development would increase regional employment and income by an unknown amount.



RESOURCE	CURRENT MANAGEMENT	RESOURCE PROTECTION	COMMODITY PRODUCTION	BALANCED USE
SOCIO-ECONOMICS (CONT.)		Decrease in authorized AUMs of 49,542 could decrease operator wealth by \$2,972,520.	An increase in authorized AUMs of 7,406 could increase operator wealth by \$444,360.	A decrease in authorized AUMs of 35,992 could decrease operator wealth by \$2,159,520.
		Increases in big game hunting (4,060 hunter days) and other recreational activities (2,125 visitor days) would increase local revenues by \$288,325.	Increases in big game hunting (1,560 hunter days) and other recreational activities (5,900 visitor days) would increase local revenues by \$335,700.	Increases in big game hunting (5,310 hunter days) and other recreational activities (4,700 visitor days) would increase revenues by \$450,450.
		Population increases would increase demands on community infrastructure.	Population increases would increase demands on community infrastructure.	Population increases would increase demands on community infrastructure.
		No significant effects.	A 16 percent increase in traffic volume on the four major highways would reduce the level of service and increase the number of accidents.	A 13 percent increase in traffic volume on the four major highways would reduce the level of service and increase the number of accidents.
TRANSPORTATION	No significant effects.			



## CHAP. 2 - DESCRIPTIONS AND COMPARISONS OF ALTERNATIVES

### RATIONALE FOR PREFERRED ALTERNATIVE

The Balanced Use Alternative has been identified as the preferred alternative because it optimizes the use of forage, energy, and other natural resources while protecting critical resources such as wildlife habitat, cultural resources, endangered and threatened species, etc.

This alternative allows ranchers to continue their operations at a level that they have been accustomed to in recent years, thus avoiding severe economic hardships for most permittees. The grazing level in this alternative will protect the range resource from deterioration through overgrazing and will allow range condition improvement in some allotments. The proposed grazing levels are only a starting point; the monitoring program will determine the ultimate grazing levels.

The proposed allocation of forage will satisfy the current demand by wildlife populations and allow for increased wildlife numbers in areas where the potential for increases exists.

The use of fire management under this alternative allows protection of property and critical resources while providing for the use of fire as a beneficial tool within

selected areas. Proper management will provide more desirable habitat and forage for wildlife and livestock.

This alternative will impose the least restriction possible upon off-road vehicles while protecting critical resource values such as wildlife, wild horses, and endangered and threatened species.

This alternative will provide an area where wild horses can be managed to maintain a viable herd in a location where they will be least susceptible to disturbing influences such as energy development and human activity.

The desires of recreationists for primitive facilities in support of hunting will be satisfied under this alternative. The need for developed campgrounds is unlikely, due to the lack of recreational attractions which tend to concentrate people and the seasonal use that is limited to a few weeks in the fall.

The right-of-way corridors identified under this alternative provide a means to transport products through the BCRA without being detrimental to the critical resources. This network will satisfy the needs of both public utilities and private industry.

This alternative will allow BLM to dispose of isolated parcels where management is unfeasible or impractical, while acquiring properties that can benefit BLM management.



# Chapter 3

## Affected Environment









# CHAPTER 3

## AFFECTED ENVIRONMENT

### INTRODUCTION

The affected environment is that portion of the existing environment that would be affected by implementation of any of the alternatives. This chapter provides information about those portions of the environment that would be significantly affected by the alternatives, as determined by the impact analyses presented in Chapter 4.

### MINERALS

#### Oil and Gas

Oil and gas exploration, development, and production are occurring in the BCRA on a large scale. Uintah County ranked second in the State for cumulative oil and gas production and first for total footage drilled in 1980 (Brown 1981).

General information on the various oil and gas fields including type and amount of production, location, and number of producing wells within the BCRA are provided on Table 3-1 (Brown 1981). All oil and gas leases are currently issued under the existing oil and gas category system presented in Chapter 2 (Current Management Alternative).

A favorability and certainty system pertaining to oil and gas is shown in Figure 3-1. The first rating is an estimate of the favorability (f) of the geologic environment to contain oil and gas. The f1 rating is assigned because it is unfavorable for oil and gas accumulations. Ratings of f2, f3, or f4 would correspond to increasing levels of geologic favorability. (For instance, an area assigned an f4 rating would be in an environment that is favorable for oil and gas accumulations exceeding 50 million barrels of oil, or if gas, 300 billion cubic feet, as described in Appendix 4 (Specialized Mineral Terminology). The second rating is the degree of certainty (c) that the resource does or does not exist. If little is known about the existence of the resource in the area, certainty ratings of c1 or c2 would be assigned for that particular resource, regardless of the assigned favorability rating. A c2 rating for oil and gas indicates that no direct data are available to support or refute the existence of oil and gas. Higher degrees of certainty (c3 and c4) indicate that direct data are available either supporting or refuting the existence of the resource in the area.

Currently, 150,000 acres are classified as f3. This is the highest rating found within the BCRA using this system. Approximately 900,000 acres are classified as f2 with the remaining 30,000 acres on Blue Mountain classified as f1.

Known geologic structures (KGS) representing producing or producible oil and gas areas are displayed in Figure 3-2. Currently, approximately 450,000 acres within the BCRA are delineated as KGSs. As new fields are discovered and existing areas are reanalyzed, the size of the KGSs are expected to increase.

A call for general expression of interest, which included a request for mineral potential ratings, was released September 2, 1982. The request was forwarded to the Rocky Mountain Oil and Gas Association (RMOGA) which uses the RMOGA Energy and Mineral Evaluation System. Eight companies responded including: Pennzoil, Atlantic Richfield, Conoco, Celeron, Chevron, Champlin, Marathon, and Wexpro. The entire resource area was rated good to excellent for potential oil and gas development, with the exception of the Blue Mountain area, which was rated poor.

#### Oil Shale

Oil shale does not contain oil, but an organic-rich matter, kerogen, which may be converted to oil through processing. There are seven oil shale units in the Uinta Basin located primarily in the Parachute Creek member of the Green River formation. The Mahogany Zone is one of these units. The optimum oil shale section in the Mahogany Zone, called the "Rich Zone", is the main target of economic interest and appears to be the most promising section for oil shale development. Higher strength beds of low grade oil shale at the top and bottom are expected to yield satisfactory roof and floor conditions. This unit, as described in barrels per acre, is shown in Figure 3-3 (Trudell, et al. 1983). The "rich zone" in the BCRA ranges from 30 to 55 feet thick and yields from 22 to 34 gallons of oil per ton (Trudell 1983). The 2,000-foot overburden line shown in Figure 3-3 is the maximum depth at which underground mining would generally occur.

Two federal oil shale tracts are currently under lease within the BCRA. These tracts, U-a and U-b, are leased in accordance with the Prototype Oil Shale Leasing Program (BLM 1973) and are commonly known as the White River Shale Project (Figure 1-4).

The presence of confirmed deposits of oil shale has been administratively designated as Known Oil Shale Lease Areas (KOSLAs). KOSLAs have the following characteristics:

- Minimum 25 gallons per ton;
- Minimum 25-foot thick Mahogany bed;
- Maximum 3,000 feet of overburden;
- A direct data point within 3 miles.

The location of KOSLA's in the BCRA are shown in Figure 3-4.

In response to the BLM's call for a general expression of interest, the oil shale industry identified only areas applicable to in situ development. The areas identified have between 0 and 200 feet of overburden and are indicated in Figure 3-5. No areas were identified in response to a site specific call for expression of interest.



TABLE 3-1

## General Oil and Gas Production - Book Cliffs Resource Area

Field	Location SLBM	Cumulative Production thru 1980		Wells (thru 1981)		Remarks
		Oil (Barrels)	Gas (MCF)	Producing	Producible	
Brennan Bottom	T7S, R20 & 21E	830,000	803,000	3	4	
Buck Canyon	T1S, R21E	--	486,000			Shut In
Coyote Basin	T8S, R24 & 25E	887,000	310,000	8	9	
Fence Canyon	T15S, R22 & 23E	1,200	4,798,000	3	3	Partially in Grand County
Flatrock	T14S, R20E	28,000	2,000	2	Unknown	
Horsepoint	T16S, R23E	--	1,792,329	3	Unknown	
Horseshoe Bend	T6 & 7S, R21 & 22E	163,000	13,313,000	7	13	
Natural Buttes	T8, 9, & 10S, R20, 21, 22 & 23E	285,000	74,028,000	109 230	169 303	1979 1981
Main Canyon		423,000	125,000	1		
Oil Springs	T11 & 12S, R24E	19,000	1,988,000	1	1	1979
Red Wash*	T7 & 8S, R21, 22, 23 & 24E	115,087,000	314,139,000	267	Unknown	
Rockhouse	T11S, R22, 23, & 24E	9,000	7,242,000	6	10	
River Junction	T9S, R20E	156,000	192,000	2	2	1979
Seep Ridge	T13S, R22E	3,000	2,847,000	1	7	
Southam	T10S, R23E	13,000	953,000	5	7	
Undesignated Fields		56,000	2,641,000	49	66	
Total		118,000,000	425,660,000			

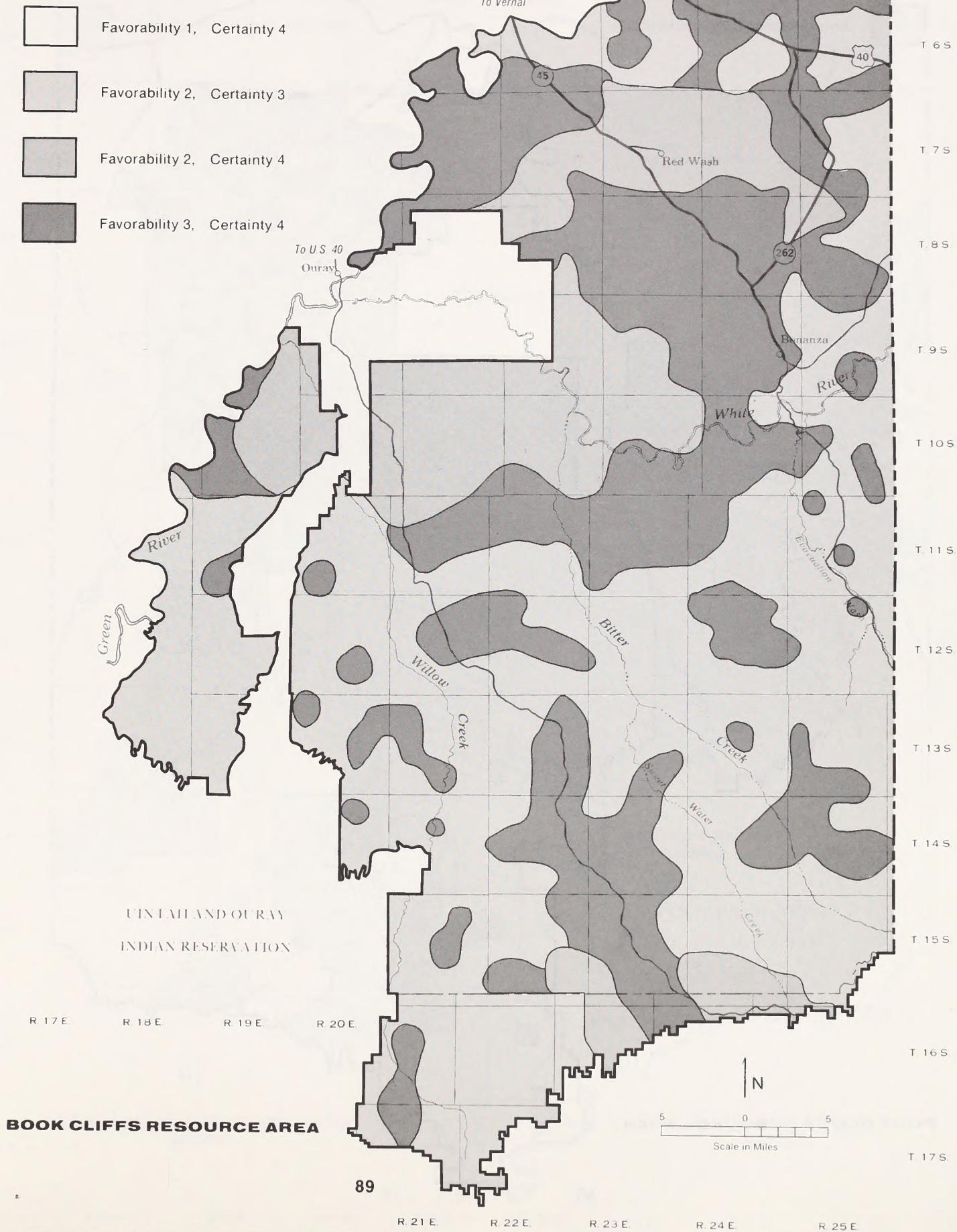
MCF = 1,000 cubic feet; SLBM = Salt Lake Base and Meridian

\*Includes Gypsum Hills, Powder Springs, Walker Hollow, Wonsits Valley, White River, Red Wash Unit, Red Wash-Gas and Red Wash-Mesaverde.



# OIL AND GAS FAVORABILITY

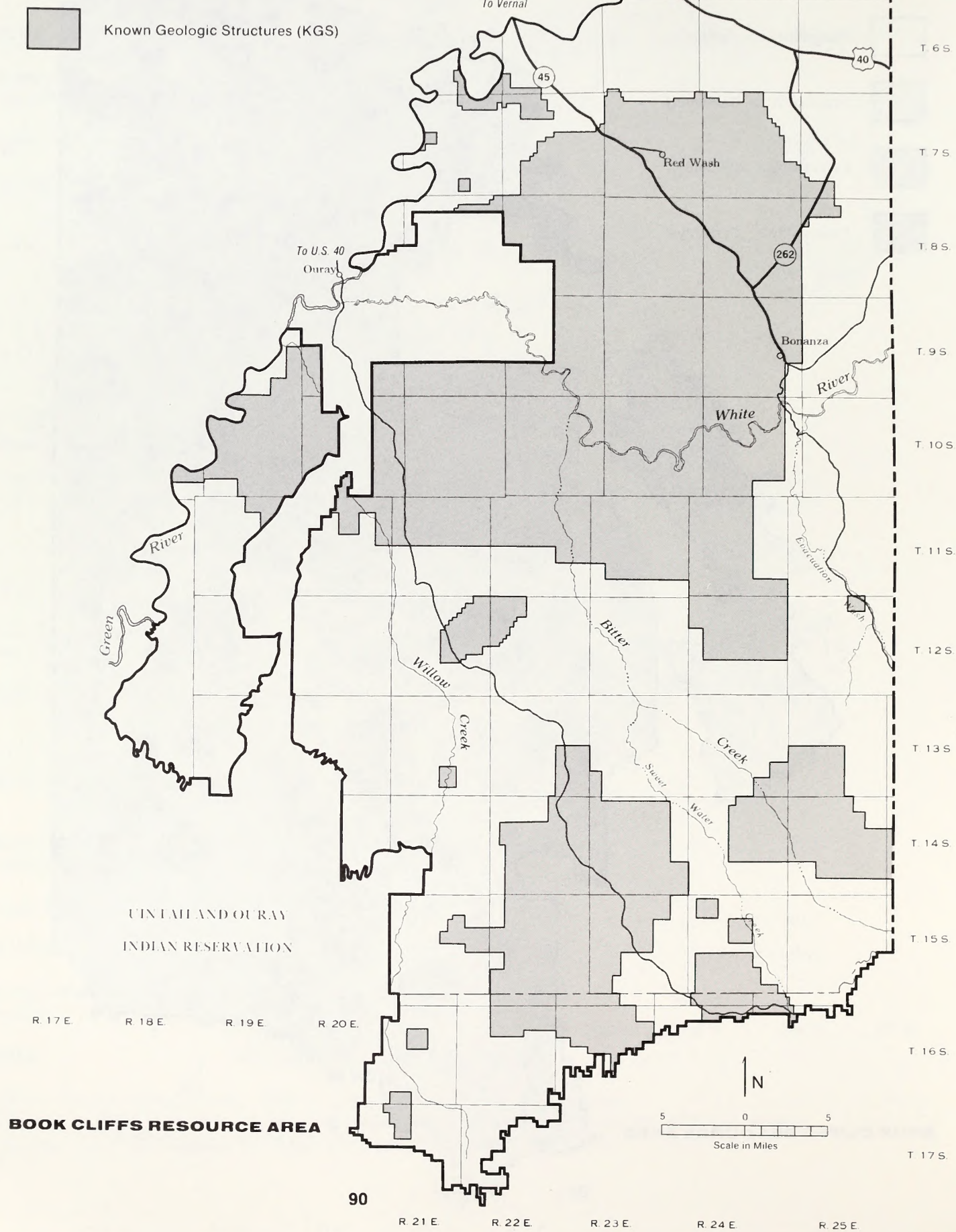
Figure 3 - 1





# **KNOWN GEOLOGIC STRUCTURE (PRODUCIBLE OIL AND GAS AREAS)**

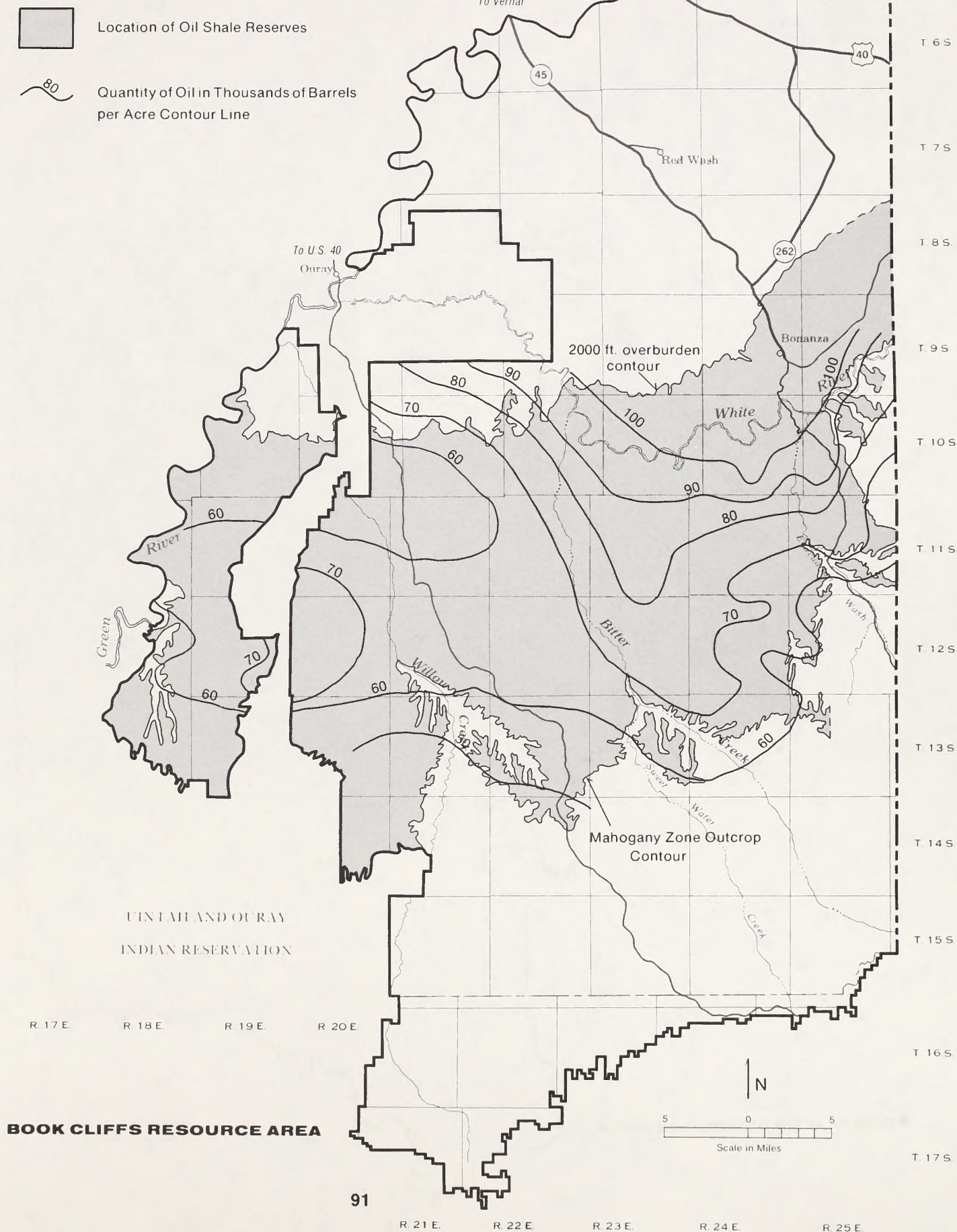
**Figure 3 - 2**





# OIL SHALE RESERVES WITH LESS THAN 2000 FT. OVERBURDEN

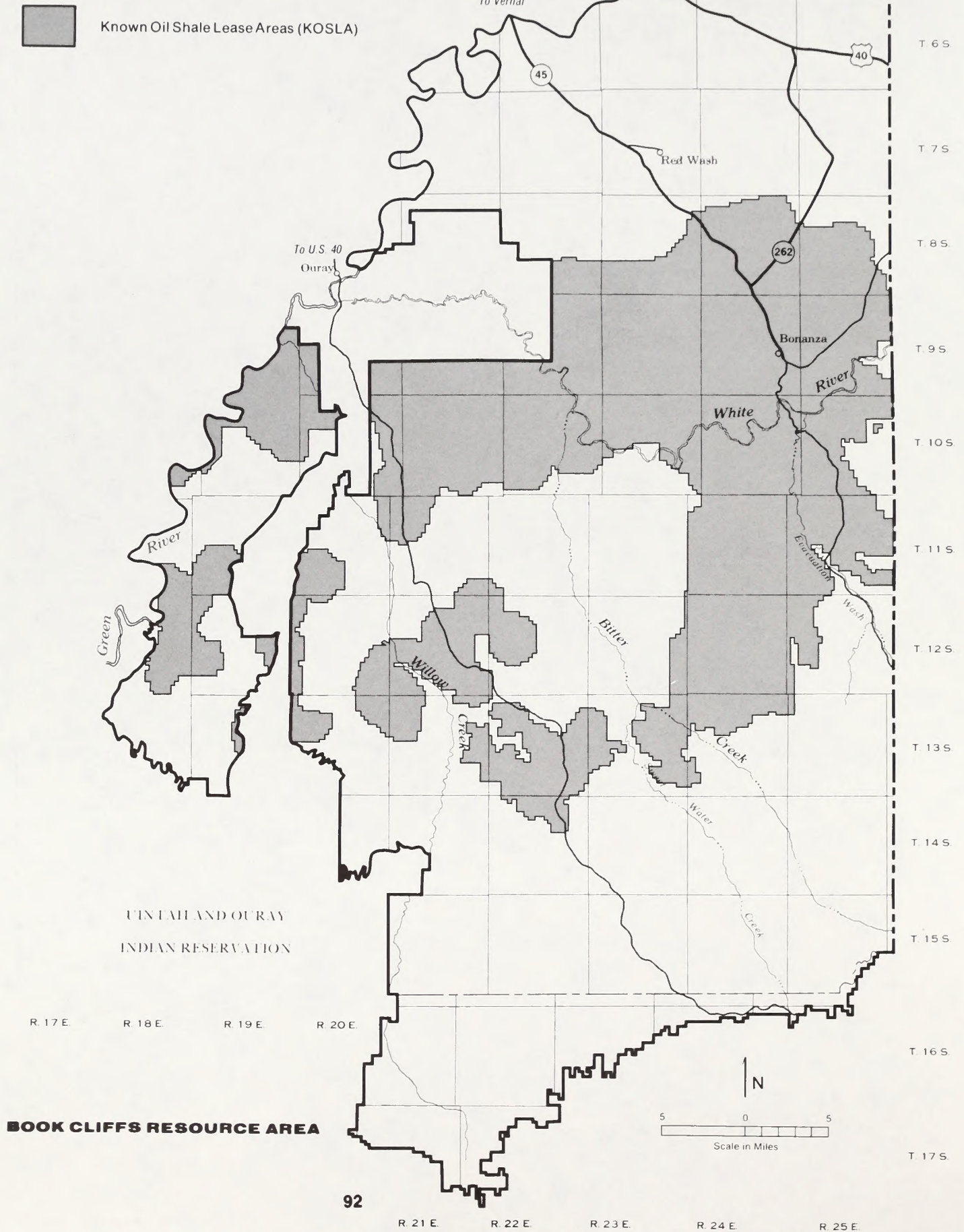
Figure 3 - 3





# **KNOWN OIL SHALE LEASE AREAS**

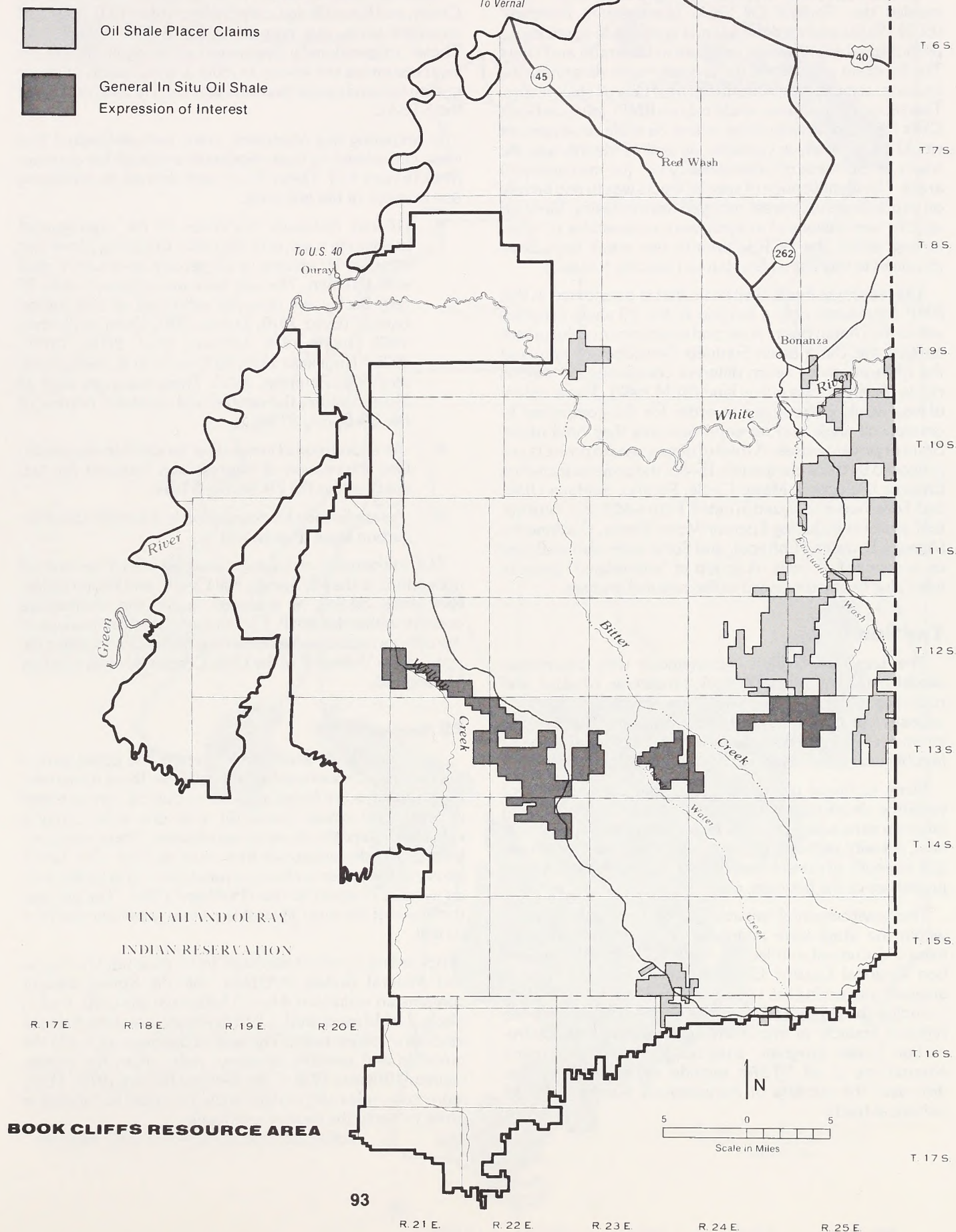
**Figure 3 - 4**





# OIL SHALE PLACER CLAIMS AND AREAS OF GENERAL EXPRESSION OF INTEREST FOR OIL SHALE

Figure 3 - 5





## CHAP. 3 - AFFECTED ENVIRONMENT

A recent Draft Environmental Impact Statement (EIS) entitled the "Federal Oil Shale Management Program" (BLM 1983a) analyzed the general regionwide impacts of a proposed oil shale leasing program in Colorado and Utah. The program established the procedures to determine the location, schedule, and stipulations for new oil shale leases. This proposed program would rely on RMPs (such as Book Cliffs RMP) to identify areas where oil shale development would be generally acceptable, as well as identify specific tracts within these oil shale priority use (or management) areas. The identification of specific tracts was to rely heavily on expressions of interest received from industry. Since no specific expressions of interest were received for oil shale leasing within the BCRA, priority use areas have been identified in this document, but not specific tracts.

The leasing of Federal oil shale that is considered in this RMP represents only a portion of the oil shale program within the Uintah Basin. A second environmental document entitled the Uinta Basin Synfuels Development analyzed the applications by seven different companies for various rights-of-way across public land (BLM 1982). These rights-of-way would be required in order for the companies to develop oil shale and tar sand reserves they hold under *State or private leases*. A total of nine separate projects are proposed by these companies. Five of the projects including Enercor (Rainbow), Magic Circle, Paraho, Syntana-Utah, and Tosco were analyzed in detail. Four additional 'conceptual' projects including Enercor-Mono Power, Geokinetics (Agency Draw and Lofreco), and Sohio were also analyzed on a conceptual basis. A group of 'interrelated' projects were also briefly discussed in the regional analysis.

### Tar Sand

The term tar sand is synonymous with bituminous sandstone, oil-impregnated rock/sandstone, oil sand, and rock asphalt. Oils in tar sand are similar to heavy oil deposits but have a much greater viscosity. The tar sand bitumen viscosity is such that commercial production is not feasible using primary or secondary production methods.

Many technical questions concerning the feasibility of resource development remain to be answered including bitumen saturation, depth of overburden, pay zone thickness, porosity, permeability, particle size distribution, mechanical strength of consolidated sands, mineralogy of sands, properties of the bitumen, etc.

The environmental impacts of tar sand development within the State were addressed in a separate environmental document entitled the Utah Combined Hydrocarbon Regional Leasing EIS. It contains four volumes of analysis concerning the 11 Special Tar Sand Areas in Utah, including the three STSAs in the BCRA. It evaluates the regional impacts of implementing the Combined Hydrocarbon Lease program, analyzes the leasing category alternatives of all STSAs outside of the BCRA, and discusses the impacts of competitively leasing up to 18 individual tracts.

Three Special Tar Sand Areas (STSAs), PR Spring, Hill Creek, and Raven Ridge, comprising a total of 217,000 BLM managed acres, are present in the BCRA (Figure 3-6). These congressionally designated areas signify where tar sand resources are known to exist. Limited areas of lesser quality tar sand resources are also known to exist outside of the STSAs.

In preparing this document, areas were delineated that were considered to have moderate potential for development (Figure 3-7). These areas were defined as containing one or more of the following:

- -10-foot minimum thickness of the impregnated sandstone zone, with the zone containing 13 percent bitumen by volume or 50 percent pore space filled with bitumen. The pay zone was approximately 15 feet thick with reserves estimated at 700 million barrels (Byrd 1970; Dahm 1980; Dana and Sinks 1982; Guynn 1970; Johnson, et al. 1975a, 1975b, 1975c; Kuuskraa 1978; McCarthy, et al. 1983; Peterson 1974; Peterson 1975). These reserves were all located within the central and southern portion of the PR Spring STSA.
- -An expression of interest for tar sand development. One expression of interest was received for two areas within the PR Spring STSA.
- -An application for conversion to a combined hydrocarbon lease (Figure 2-2).

The assignment of leasing categories (such as special mitigation) to the PR Spring, Hill Creek, and Raven Ridge-Rim Rock STSAs is analyzed under the alternatives concept within this RMP. This analysis is similar in scope to the categorization of the remaining STSAs throughout the state within Volume II of the Utah Combined Hydrocarbon Leasing EIS.

### PR Spring STSA

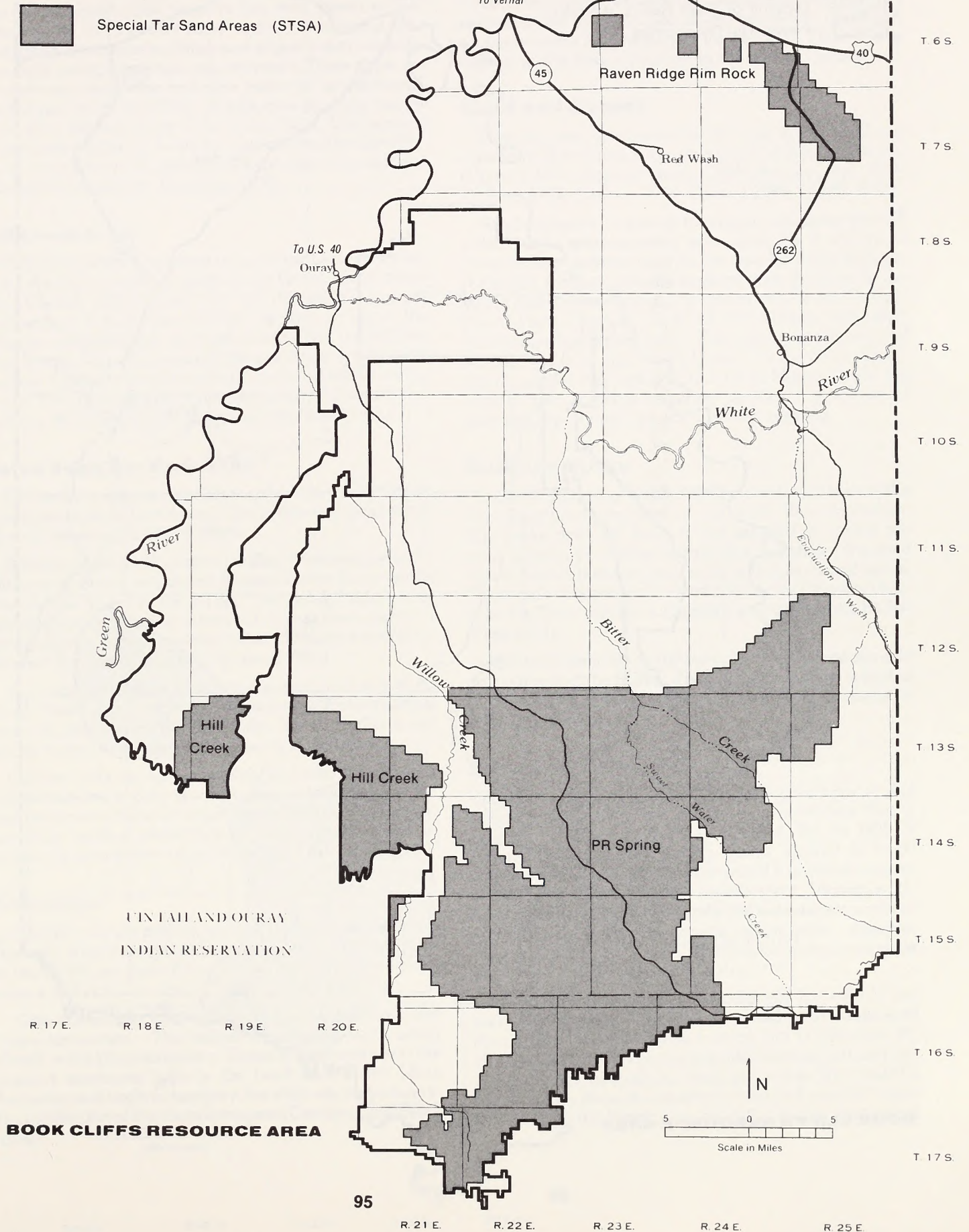
The principal tar sand zones occur in the upper part of the Douglas Creek member of the Green River formation. Impregnations are found in 13 zones but are concentrated in 5 principal zones. Generally, only one zone contains substantial deposits at any single location. These zones are lensing and discontinuous from area to area. The cumulative net thickness of all zones varies from 10 to 80 feet with an average of about 35 feet (Hubbard 1983). The average thickness of the most favorable zone is generally less than 20 feet.

According to recent statistics from the Utah Geological and Mineral Survey (UGMS), the PR Spring deposit contains an estimated 4 to 4.5 billion barrels (bbl) of oil in place, 2.5 bbl measured, 1.2 bbl indicated, and the balance inferred or conjectured. The bulk of the reserves are in the probable and possible category, rather than the proven category (Ritzma 1979; Campbell and Ritzma 1979). Many more core holes and surface sections would be needed in order to verify the reserve estimates.



# SPECIAL TAR SAND AREAS

Figure 3 - 6



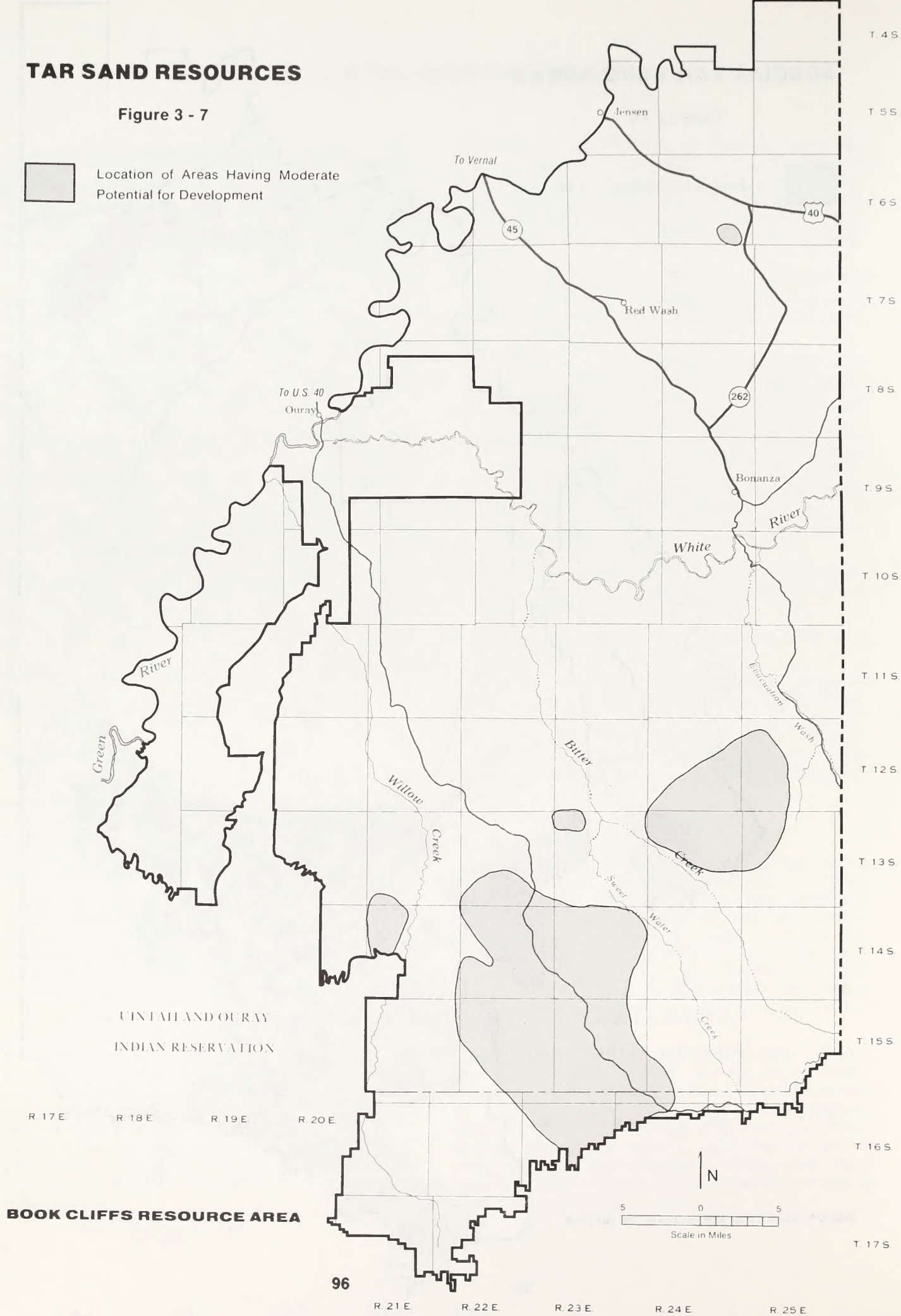


# TAR SAND RESOURCES

Figure 3 - 7



Location of Areas Having Moderate Potential for Development





## CHAP. 3 - AFFECTED ENVIRONMENT

It is not well understood where surface mining versus in-situ development could occur in this area. Based on pay zones in the 10 to 20 foot range and a 1/1 stripping ratio (thickness of overburden/thickness of pay zone) relatively few areas would meet these requirements. These areas are located near pay zone outcrops primarily in the south-central portion of the STSA. Overburden generally ranges from 50 to 300 feet (Byrd 1970; Dahm 1980). This range is considered suitable for in situ thermal combustion development, but not for in-situ steam processes due to insufficient overburden pressures (Kuuskraa 1978).

### Hill Creek STSA

The bitumen impregnations occur in the Douglas Creek and Parachute Creek members of the Green River formation. Limited data indicate that the deposit has a gross thickness of 5 to 35 feet and that, at any one place, the bitumen occurs in one to three zones. The overburden ranges from none at outcrops in the south to more than 500 feet just 1,300 feet from the outcrop, and even thicker to the north. The concentration of bitumen generally is less than it is at the PR Spring STSA to the east (Hubbard 1983).

### Raven Ridge/Rim Rock STSA

Bitumen impregnations occur in sandstones of the Green River formation of Tertiary age. Rocks dip southwesterly at 10 to 33 degrees (Hubbard 1983).

Bitumen impregnations occur in discontinuous layers. At different locations, significant impregnations occur within one to four layers in the STSA. The gross thickness of bitumen ranges from 5 to 95 feet, but no data are available to describe the net thicknesses or other characteristics of the bitumen-impregnated layers (Hubbard 1983).

A narrow band of bitumen-impregnated rock occurring along Raven Ridge could be extracted by surface-mining methods. Bitumen in the remainder of the deposit is too deeply buried to be extracted by surface methods.

Current data do not adequately describe the bitumen concentrations in pore spaces in the rock or the number and thickness of bitumen-impregnated layers. The deposit has only modest probability of commercial extraction within the foreseeable future (Hubbard 1983).

### Gilsonite

Gilsonite occurs as long, narrow, vein deposits between the walls of northwest-trending, nearly vertical joints. Veins in the BCRA are about 0.5 to 7 miles long and vary in width from a few inches to about 18 feet (Figure 3-8).

Gilsonite veins occur in the Wasatch, Green River, and Uinta formations. The widest and longest veins occur mainly in the Uinta formation. These veins are widest in the massive sandstone beds in the basal part of the Uinta formation and begin to narrow in the shale and sandstone in the middle part of the Uinta formation (Cashion 1968; Pruitt 1960).

Currently, there are 12 federal gilsonite leases. A total of three mining operations exist on these leases. Less than five percent of the total gilsonite production within the BCRA occurs from the Federal leases (Vance 1983). There is little interest at this time in developing new Federal leases.

### Sand and Gravel

Most deposits are located in terraces along the Green and White Rivers and in terraces south of Blue Mountain, (Figure 2-18 Rowley and Hansen 1979; Rowley, et al. 1979; Cashion 1974; Cashion 1978; Carrara 1980; USDH 1971).

Sand and gravel materials totaling an estimated 900,000 cubic yards have recently been used for a variety of construction projects such as the new Bonanza highway (Utah 45), the new highway segment from Bonanza to the White River Shale Project, the new railway to the Deseret Power Plant, upgrading U.S. 40, two bridges, and other related construction activities. The majority of this material was derived from a gravel pit located on the Green River; the remainder was taken from a pit in Miners Draw. No construction activities requiring significant quantities of sand and gravel materials are currently ongoing.

### Building Stone

Suitable stone is generally found in sandstone beds of the Parachute Creek member of the Green River formation. The stone does not have to be quarried; it covers the ground surface in almost uniform size and shape. It is used for decorative home projects such as fireplaces and patios. Three collection areas totaling 21,500 acres (Nutters Hole, Johnson Draw and Buck Canyon) are found in the BCRA (Figure 2-4).

Approximately 100 to 200 tons of building stone are sold annually within the BCRA. The purchase of stone is limited to 15 tons per person/company limiting the extent of commercial interest.

### Locatable Minerals

The general mining law of 1872 authorized placer and lode mining claims to be located by a procedure that is largely unchanged to this day (17 Stat. 91). In 1930, it became apparent that mining claims located in lands considered valuable for oil shale posed a potential encumbrance against future oil shale development. Subsequently, lands considered valuable for oil shale were withdrawn from appropriation under the general mining laws. Approximately 75 percent of the BCRA remains under an oil shale withdrawal and is not open to entry.

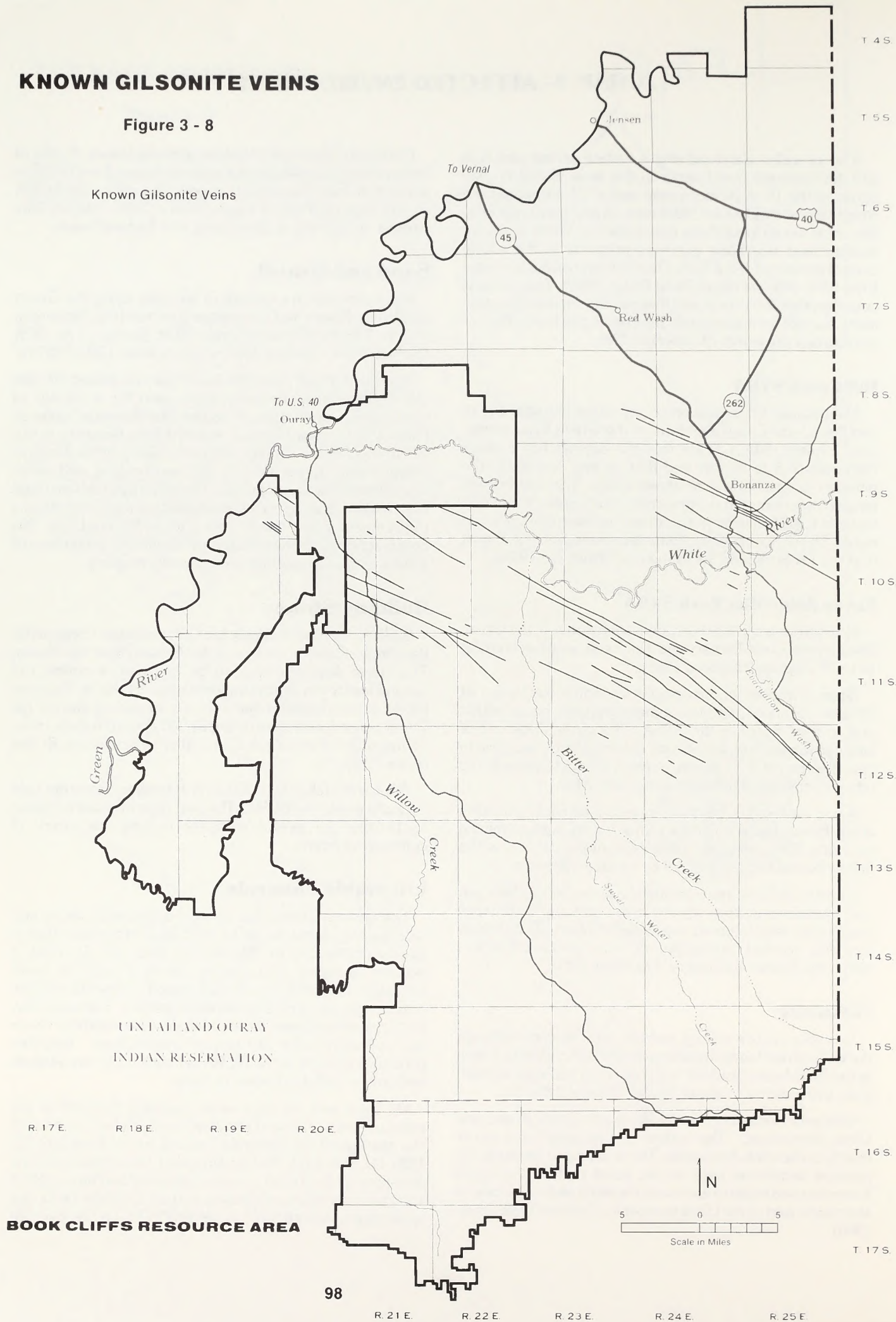
Oil shale and tar sand were originally included in the claim-patent system and remained available to location until the passage of the Minerals Leasing Act of February 25, 1920, (41 Stat. 437). This law provided that deposits of coal, phosphate, oil, oil shale, tar sand, gas, and sodium could be acquired only through a leasing system and were no longer applicable to the Mining Law of 1872. This law recognized



# KNOWN GILSONITE VEINS

Figure 3 - 8

Known Gilsonite Veins





## CHAP. 3 - AFFECTED ENVIRONMENT

"prior existing" rights under the general mining law of 1872 for claims located prior to 1920. Unpatented oil shale and tar sand claims of record exist within the BCRA (Figure 3-5).

Within the BCRA, there has been no past production of any economic significance for those minerals presently considered locatable (uranium, placer gold, and copper for example). The BCRA is considered to have little or no potential for future economical mineral developments.

Passage of the surface management regulations of January 1, 1981, provides for reclamation of unpatented mining claims (including the pre-1920 oil shale claims) where surface disturbance is considered greater than casual use (43 CFR 3809). All required reclamation plans are subject to review and if they are deemed inadequate are subject to possible rejection.

### RIGHT-OF-WAY CORRIDORS

Several hundred miles of rights-of-way currently exist in the BCRA. These rights-of-way are used for a variety of projects including, but not limited to, oil and gas pipelines, communication lines, powerlines, water pipelines, and roads.

Two major north-south corridors are the Seep Ridge Road on the western part of the BCRA and the Mapco pipeline route near the Utah-Colorado border. Both of these corridors currently accommodate oil and gas pipelines and roads and have the capacity for additional rights-of-way. Another north-south corridor accommodates the Vernal-Bonanza road and a water pipeline. The only major east-west corridor occurs along U.S. Highway 40. These existing corridors would not adequately serve tar sand and oil shale development areas.

The width of existing and planning corridors is highly variable, but averages approximately 0.6 mile.

### FORAGE

For purposes of forage planning and analysis, the BCRA has been divided into four sub areas termed localities. These groupings are based upon resource problems that are common to several allotments and which could be resolved by similar management actions. These localities have been called Blue Mountain, Bonanza-Rainbow, Book Cliffs, and Hill Creek.

**Blue Mountain Locality.** This locality contains Blue Mountain and is located east of the Green River and north of Highway 40. Elevation ranges from 4,800 feet to 8,300 feet. The bulk of the area consists of a high sage-grass plateau. The adjacent slopes breaking into the Green River are primarily occupied by pinyon and juniper with some mountain browse on the upper north-facing slopes. This locality is 38,000 acres in size. Soils and vegetation have been classified into ecological sites and rated by condition as summarized in Appendix 10 (Ecological Sites and Condition by Locality). Approximately 600 acres are rated in poor ecological condition, 8,000 acres in fair condition,

27,400 acres in good condition, and 2,100 acres in excellent condition. Maps and detailed ecological condition data are found in the Vernal District Office inventory files.

This locality contains six allotments. The season of use is predominantly summer; class of livestock is primarily cattle with some sheep and horse use [Appendix 11, (Allotment Statistics) and Map 1].

Average livestock use is 5,835 AUMs. This is more than active preference because 157 AUMs have been allowed on a non-renewable basis in the Blue Mountain allotment due to sagebrush treatments and an Allotment Management Plan.

Average livestock use in this locality is currently near the active grazing preference. Average wildlife use is currently 1,768 AUMs, 768 AUMs above the allocated 1,000 AUM level. Thus, an apparent conflict in utilization of available forage by livestock and wildlife exists. The degree of non-competitive use of available forage by livestock and wildlife was not fully considered during the inventory process of the 1960's (Oldroyd 1984). Additional monitoring studies may be needed to clarify the situation.

The grazing pattern for most allotments is season long. An AMP has been developed and implemented on one allotment. In addition, a grazing system has been implemented on one allotment on a voluntary basis by the permittee.

Range studies show heavy utilization (61 to 80 percent) on three allotments (Blue Mountain, Stuntz Valley, and Point of Pines) and trend studies appear to show a slight downward trend. Sagebrush is increasing at the expense of grass and forb species on these allotments (BLM 1983). Data from range studies are either not available or incomplete on the remaining three allotments.

From 1962 to 1966, approximately 11,000 acres of sagebrush were sprayed on the Point of Pines, Stuntz Valley, Doc's Valley, and Blue Mountain allotments. Present carrying capacity ratings for livestock and wildlife reflect the benefits derived from these land treatments. However, the benefits gained from these treatments have greatly decreased as a result of reinvasion of sagebrush. Retreatment is needed to maintain the current grazing numbers of livestock and wildlife. In recent years, there has been some restraint imposed on sagebrush control to protect sage grouse habitat.

**Bonanza-Rainbow Locality.** This locality is the largest of the four localities. The most prominent landmarks are the White River which flows through the center of the area and the Green River which makes up a portion of the western boundary. Elevation ranges from 4,800 feet to 6,800 feet. The area is composed mainly of desert shrub with pinyon and juniper in the higher elevations. This locality is approximately 633,200 acres in size. Soils and vegetation have been classified into ecological sites and rated for condition as summarized in Appendix 10 (Ecological Sites and Condition by Locality). Approximately 9,000 acres are rated in poor ecological condition, 257,500 acres in fair condition, 343,800 acres in good condition, and 22,800



## CHAP. 3 - AFFECTED ENVIRONMENT

acres in excellent condition. Maps and detailed ecological site and condition data are found in the Vernal District Office inventory files.

This locality contains 30 allotments (Map 1). Average livestock use is 37,352 AUMs. Active preference is 61,323 AUMs. This amounts to 39 percent nonuse. The season of use for livestock is dominantly winter and early spring; the class of livestock is mostly sheep with cattle use along the rivers and at the higher elevation (Appendix 11, Allotment Statistics). The grazing pattern for most allotments is season long. There are six AMPs completed. One AMP is winter use only and the other AMPs use a deferred rotation system to rotate spring use.

This locality is normally grazed with snow on the ground; hence, water for livestock is normally not a problem. However, increased waters would provide improved livestock distribution during the spring and fall and help prevent over utilization of areas around current water sources.

There are two antelope herd units within the locality, herd unit 7 and the East Bench herd. At the time the area was adjudicated, 312 AUMs were allocated for antelope (without regard for non-competitive use) in herd unit 7; and because of the small amount of antelope use, no AUMs were allocated on East Bench. Current antelope demand in herd unit 7 amounts to 592 AUMs annually. The antelope herd on East Bench presently requires 170 AUMs and the herd is expected to increase. This apparent deficit in antelope demand is currently absorbed by the high level of nonuse taken by livestock.

Although habitat for deer is generally marginal, portions of deer herd units 26 and 28A lie within this locality. No major forage problems exist. However, certain key habitat areas, such as along the Green and White Rivers and in the higher pinyon and juniper areas, present the possibility of localized forage competition between livestock and wildlife.

The wild horse herd within this locality was not adjudicated for in the 1960's. Currently, this herd consumes approximately 480 AUMs of forage annually. Nonuse taken by livestock has prevented over utilization of the range.

Overall, range studies indicate that trend is stable to slightly upward and utilization is light in most areas. In a few areas along the Green River, trend studies appear to show a slight downward trend (BLM 1983).

**Book Cliffs Locality.** The Book Cliffs locality consists of the upper portion of the Roan Plateau between the Uintah-Ouray Indian Reservation and the Utah-Colorado state line. Elevations range from 6,200 feet to 8,700 feet. The locality is composed of long north-sloping ridges and drainages of the Roan Plateau. The vegetation is pinyon-juniper, Douglas fir, browse, sagebrush, grass and small areas of aspen. This locality is approximately 304,000 acres in size. Soils and vegetation have been classified into ecological sites and rated by condition as summarized in Appendix 10 (Ecological Sites and Condition by Locality). Maps and detailed ecological site and condition data are found in the Vernal District Office. Approximately 400

acres are rated in poor ecological condition, 64,200 in fair condition, 195,900 in good condition, and 43,500 acres in excellent ecological condition.

This locality contains eight allotments (Map 1). Four of these allotments have grazing systems that either defer or rest pastures during the critical growing season. The degree of rest for these pastures vary by AMP according to terrain and livestock movement. Three allotments have season long use. One allotment is managed by BLM in Colorado.

Average livestock use is 17,351 AUMs. Active preference for livestock is 23,174 AUMs. This amounts to approximately 25 percent nonuse. The season of use for livestock is predominantly summer and fall. The class of livestock is mostly cattle (Appendix 11, Allotment Statistics).

This locality represents a major portion of deer herd unit 28A and elk herd unit 21. Inventories conducted in the 1960's set aside a total of 38,867 AUMs for deer in this locality. It has since been assumed that elk would also share in the utilization of the wildlife AUMs even though elk use was initially very minor. Current deer use is 12,784 AUMs (for the entire herd unit 28A area) and current elk use is 3,192 AUMs (for the entire herd unit 21). Therefore, 22,891 AUMs allocated to wildlife are not currently being utilized. It should be noted that deer numbers were significantly higher during the 1960's than at present. This accounts for the difference between present and adjudicated demands. It should also be noted that allowance for non-competitive use of available forage by livestock and wildlife was only partially considered during the inventory process of the 1960's (Oldroyd 1984). Additional monitoring studies may be needed to clarify the situation.

Lower McCook Ridge is considered crucial for wintering deer and elk. It is also an important grazing and trailing area during the spring and fall for livestock.

The wild horse herd within this locality was not adjudicated for in the 1960's. Currently, the herd consumes approximately 108 AUMs of forage annually. Nonuse taken by livestock has prevented over utilization of the range.

Range studies indicate that overall, trend is slightly upward and utilization is generally light with some areas of moderate and heavy use in canyon bottoms and treated areas.

The key forage production areas in this locality for both livestock and wildlife are the drainage bottoms. Historically, livestock and wildlife use have been concentrated in the drainage bottoms due to terrain and the availability of water. Many of these bottoms have been overtaken by dense, overmature stands of sagebrush in the higher elevations and invasions of greasewood in the lower elevations. Treatment of these areas through vegetative manipulation would greatly increase their utility for both livestock and wildlife.

Many of the ridges have an abundance of forage that is not useable because of the lack of water. Some of the ridges have been treated mechanically to increase forage. Without maintenance of these land treatments and development of



## CHAP. 3 - AFFECTED ENVIRONMENT

additional water sources, much of this forage would not effectively be utilized and the current imbalance in the pattern of use of the ridges and drainage bottoms would continue.

**Hill Creek Locality.** This locality is bounded on the west by the Green River and on the north and west by Willow Creek. The west half of this locality is separated from the rest of the BCRA by the Uintah-Ouray Indian Reservation. The area is composed of north-sloping benches cut by steep-walled canyons. The elevation ranges from 4,600 feet to 6,900 feet. The vegetation is composed mainly of desert shrub with pinyon-juniper at the higher elevations. This locality is approximately 140,000 acres in size. Soils and vegetation have been classified into ecological sites and rated for condition as summarized in Appendix 10 (Ecological Sites and Condition by Locality). Approximately 3,900 acres are rated in poor ecological condition, 34,300 acres in fair condition, 98,100 acres in good condition, and 3,700 acres in excellent ecological condition. Maps and detailed ecological site and condition data are found in the Vernal District Office inventory files.

This locality contains 12 allotments (Map 1). Average livestock use is 6,442 AUMs. Active preference for livestock is 12,631 AUMs. This amounts to 49 percent nonuse. The season of use is dominantly winter and early spring with some summer use along the Green River. The class of livestock is mostly sheep with some cattle use along Willow Creek, the Green River, and some higher benches (Appendix 11, Allotment Statistics).

The grazing pattern for most allotments is season long. There are two AMPs within the locality. Both AMPs use a deferred rotation grazing system.

This locality is normally grazed with snow on the ground. Hence, water for livestock is normally not a problem. However, increased waters would provide improved livestock, wildlife, and wild horse distribution during the spring and fall and help prevent over utilization of areas around current water sources.

A part of deer herd unit 28A falls within this locality. Five hundred AUMs have been allocated for wildlife and deer forage is considered adequate. However, in recent years, increasing numbers of elk coming off the Uintah-Ouray Indian Reservation have been wintering in this area. No forage has been allocated for this use and no studies have been completed to determine the AUMs removed.

The wild horse herd within this locality is the largest within the District. Forage was not adjudicated for this herd in the 1960's. Currently, the 157 horse herd consumes 1,884 AUMs annually. Nonuse taken by livestock users has minimized the impact of wild horse utilization.

Trend in this locality is generally stable. General observations on sheep allotments show utilization to be light with moderate use in key areas. Use on cattle allotments is moderate in the bottoms and light on the benches (observations by BCRA personnel).

### Endangered, Threatened or Sensitive Plants

Within the BCRA, the following plants have been listed as endangered, threatened or sensitive and under review for listing (Federal Register, December 15, 1980, and Federal Register, November 28, 1983, Supplement to Review of Plant Taxa for Listing).

#### Endangered

None

#### Threatened

*Sclerocactus glaucus* (Cactus, Hookless) (Uintah Basin)

#### Sensitive

*Arabis* sp. nov. (Rock Cress) (Gray Knolls, Uintah County)

*Astragalus hamiltonii* (Milk-vetch, Hamilton)

*Astragalus lutosus* (Milk-vetch, Dragon)

*Astragalus equisolenis* (Milk-vetch) (Horseshoe Bend, Uintah County)

*Cryptantha barnebyi* (Catseye, Barneby)

*Festuca dasyclada* (Fescue, Sedge)

*Glaucocarpum suffrutescens*

*Lepidium barnebyanum* (Pepper Cress, Barneby)

*Oenothera accutissima* (Evening-Primrose) (Moffat, Daggett, & Uintah Counties)

*Penstemon grahamii* (Beardtongue, Graham)

*Penstemon goodrichii*

*Penstemon albifluvis* (Beardtongue) (White River, Uintah County)

*Thelypodopsis argillacea* (Thelypody, Clay)

The BCRA has been inventoried for endangered, threatened, and sensitive plant species. Known plant locations and potential habitat have been identified (Figure 3-9). However, specific locations are purposely not shown to protect the populations from collectors. These areas total over 300,000 acres and occur throughout the BCRA. Refer to Figures 3-1 through 3-8 to determine where this potential habitat coincides with potential oil and gas, oil shale, gilsonite, and tar sand development areas.

Since most of the sensitive species are associated with unique soils or other environmental factors that limit their distribution, the areas shown in Figure 3-9 merely indicate where these species could occur.

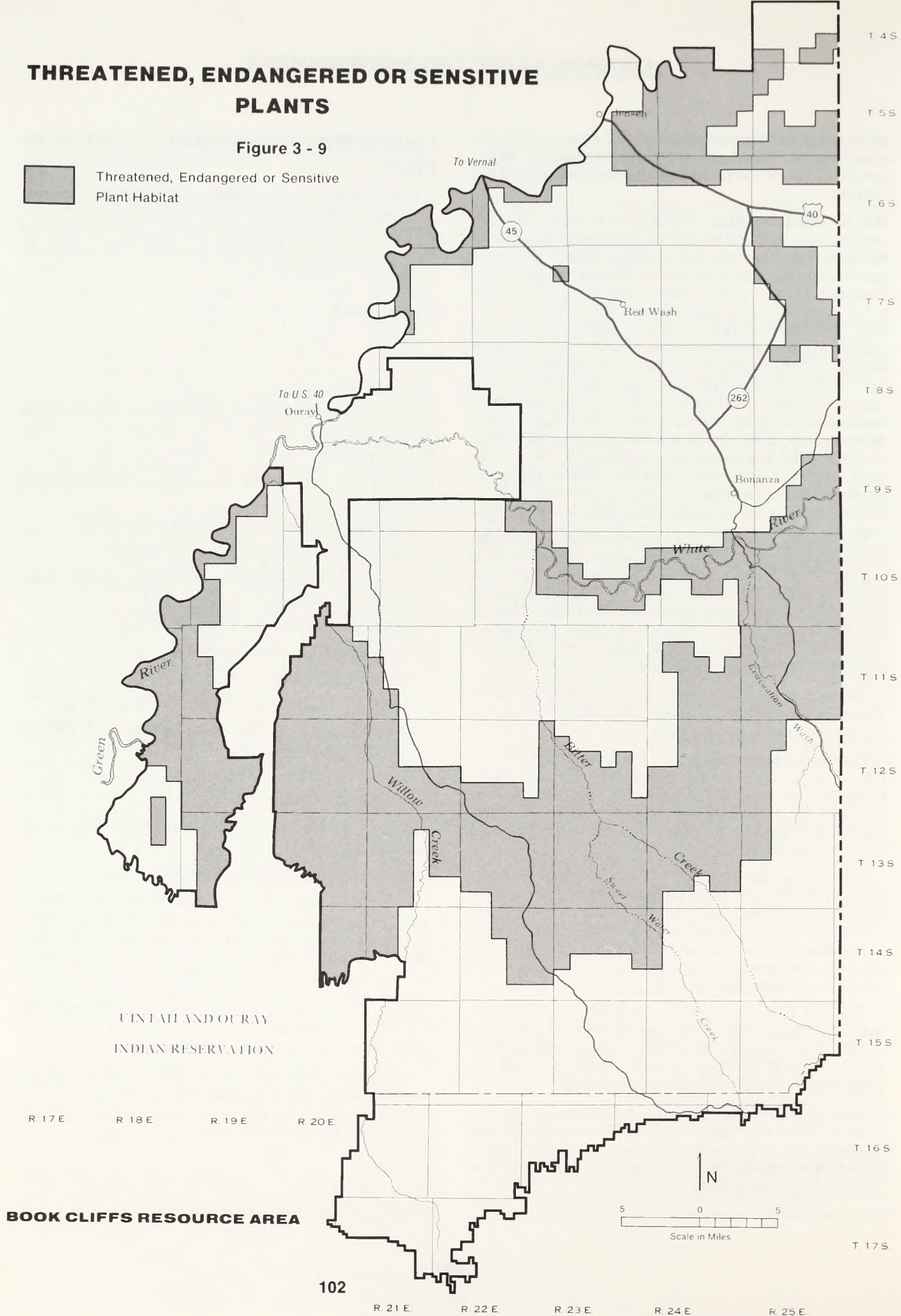


# THREATENED, ENDANGERED OR SENSITIVE PLANTS

Figure 3 - 9



Threatened, Endangered or Sensitive Plant Habitat





### WILDLIFE AND WILD HORSES

Crucial wildlife habitat delineation was based on Utah Division of Wildlife Resources (UDWR) data and observations, a recently completed BCRA deer study (Karpowitz 1983), and BLM observations and inventory.

Assignment of current condition ratings were made for the crucial seasonal wildlife and wild horse habitats found within the BCRA. Habitat areas were assigned ratings of excellent, good, fair, or poor based on the ecological site, condition, and soils inventory (BLM 1982), and observations and existing wildlife data. Habitats rated in either fair or poor ecological condition were considered "unsatisfactory" for supporting manageable wildlife and wild horse populations. Habitats rated either excellent or good were considered "satisfactory". It should be noted that habitats rated unsatisfactory are capable of improvement into the satisfactory category as a result of the application of a variety of management practices (rotation of grazing, vegetation manipulation, reseeding, etc.). The various factors (overgrazing, maturation of vegetation, etc.) potentially responsible for portions of wildlife habitats being rated in fair or poor condition, cannot be determined with information currently available [(BLM 1982), Table 3-2, (Amount and Condition of Crucial Wildlife Habitat)].

It was assumed that all wildlife and wild horse habitat and forage discussed in this document occurred on Federal lands only. It is known that wildlife and wild horses also utilize adjoining State and private lands for forage and habitat and freely travel between Federal and non-Federal lands. The BCRA consists of approximately 76 percent Federal and 24 percent non-Federal lands.

It has been assumed, therefore, that a comparable percentage of AUMs (in terms of forage) are available to, and utilized by, wildlife and wild horses from non-Federal lands.

In addition, it is known that mule deer on Blue Mountain (deer herd unit 26) regularly move back and forth between BLM-administered lands and lands administered by the National Park Service (NPS) as part of Dinosaur National Monument (Franzen 1968). It has been estimated that a total of 1,325 AUMs are utilized annually by this deer herd from NPS lands (Kennedy 1983). They have also been included in subsequent forage discussions (see Chapter 4).

### Big Game

The development of water projects for wildlife, by alternative is referenced in Table 2-1 (Objectives and Actions of the Alternatives). Many areas of suitable wildlife habitat provide adequate forage and cover, yet are not utilized to their fullest extent as a result of the lack of a nearby, reliable water source.

### Pronghorn Antelope

The locations of antelope herds 7 and East Bench are shown in Figure 3-10. Approximately 80,900 acres of crucial

antelope habitat exist for the Bonanza herd, and 18,200 acres of crucial antelope habitat exist for the East Bench herd (Figure 3-10). Roughly 55 percent and 16 percent of the Bonanza and East Bench habitat, respectively, are rated in an unsatisfactory ecological condition. The UDWR population goals for pronghorn are 1,114 head, with approximately 700 at Bonanza and 414 at the East Bench location (Smith 1983).

### Mule Deer

The locations of mule deer herds 26 and 28A within the BCRA, are shown in Figure 3-11. The BCRA contains approximately 37,900 acres and 365,500 acres, respectively, of seasonally crucial mule deer habitat in the Blue Mountain (herd 26) and Book Cliffs (herd 28A) areas (Figure 3-11). Mule deer are the most abundant big game species within the BCRA.

The majority of livestock grazing levels are compatible with current wildlife populations and objectives. The exception is mule deer herd unit 26 (Blue Mountain) where livestock levels are potentially in conflict with current mule deer numbers. Refer to the forage section for additional discussion.

Yearlong crucial mule deer habitat in the BCRA primarily consists of riparian habitat and totals approximately 60,200 acres, or 15 percent, of the total crucial habitat. Roughly 27,150 acres, or 45 percent, of the yearlong habitat is rated in an unsatisfactory ecological condition (Table 3-2).

Crucial summer mule deer habitat located within the BCRA totals approximately 117,900 acres, or 29 percent, of the total crucial habitat available. Approximately 23,000 acres, or 20 percent, of the total is rated in an unsatisfactory ecological condition (Table 3-2).

Crucial mule deer fawning habitat, identified for the Book Cliffs herd area (28A), consists of approximately 9,400 acres, or 10 percent, of the crucial summer range (3 percent of the total herd unit crucial habitat). Roughly 2,400 acres, or 26 percent, is rated in an unsatisfactory ecological condition (Table 3-2).

Considering the total crucial mule deer habitat available in the BCRA, 215,900 acres, or 50 percent, is crucial winter habitat. Perhaps the most significant deer winter habitat is the lower McCook Ridge area, where a large percentage of herd unit 28A spends the winter. Of the winter habitat, 58,700 acres, or 27 percent, is rated in an unsatisfactory ecological condition (Table 3-2).

The Monument Ridge migration corridor consists of approximately 29,100 acres, or eight percent, of the crucial mule deer habitat found within herd unit 28A (Book Cliffs). This habitat zone is utilized for approximately two to three weeks in the spring and two to three weeks in the fall as deer migrate from one seasonal use area (winter/summer) to the other.

The UDWR population goals for mule deer are 20,300 head, with 2,300 for Blue Mountain (herd unit 26), and 18,000 for Book Cliffs (herd unit 28A) (Smith 1983).



## CHAP. 3 - AFFECTED ENVIRONMENT

TABLE 3-2  
Amount and Condition of Crucial Wildlife Habitat

TYPE OF HABITAT BY SPECIES BY AREA*	CURRENT CONDITION	
	ACRES**	PERCENT OF TOTAL AVAILABLE
Antelope-BONANZA		
yearlong		
Satisfactory	36,200	45
Unsatisfactory	44,700	55
Antelope-EAST BENCH		
yearlong		
Satisfactory	15,200	84
Unsatisfactory	3,000	16
Mule Deer-BLUE MOUNTAIN		
yearlong		
Satisfactory	50	5
Unsatisfactory	1,050	95
summer		
Satisfactory	16,200	80
Unsatisfactory	4,100	20
winter		
Satisfactory	11,700	71
Unsatisfactory	4,800	29
Mule Deer-BOOK CLIFFS		
yearlong		
Satisfactory	33,000	56
Unsatisfactory	26,100	44
summer		
Satisfactory	78,700	81
Unsatisfactory	18,900	19
fawning		
Satisfactory	7,000	74
Unsatisfactory	2,400	26
winter		
Satisfactory	145,500	73
Unsatisfactory	53,900	27
Elk-BOOK CLIFFS		
summer		
Satisfactory	85,300	82
Unsatisfactory	19,000	18



### CHAP. 3 - AFFECTED ENVIRONMENT

Table 3-2 (Continued)  
Amount and Condition of Crucial Wildlife Habitat

TYPE OF HABITAT BY SPECIES BY AREA*	CURRENT CONDITION	
	ACRES**	PERCENT OF TOTAL AVAILABLE
calving		
Satisfactory	7,800	94
Unsatisfactory	500	6
winter		
Satisfactory	80,500	72
Unsatisfactory	31,900	28
Sage Grouse		
yearlong		
Satisfactory	12,000	100
Unsatisfactory	0	0
Wild Horses-BONANZA		
yearlong		
Satisfactory	32,500	69
Unsatisfactory	14,800	31
Wild Horses-HILL CREEK		
yearlong		
Satisfactory	31,100	88
Unsatisfactory	4,300	12
Wildhorses-WINTER RIDGE		
yearlong		
Satisfactory	13,500	89
Unsatisfactory	1,700	11

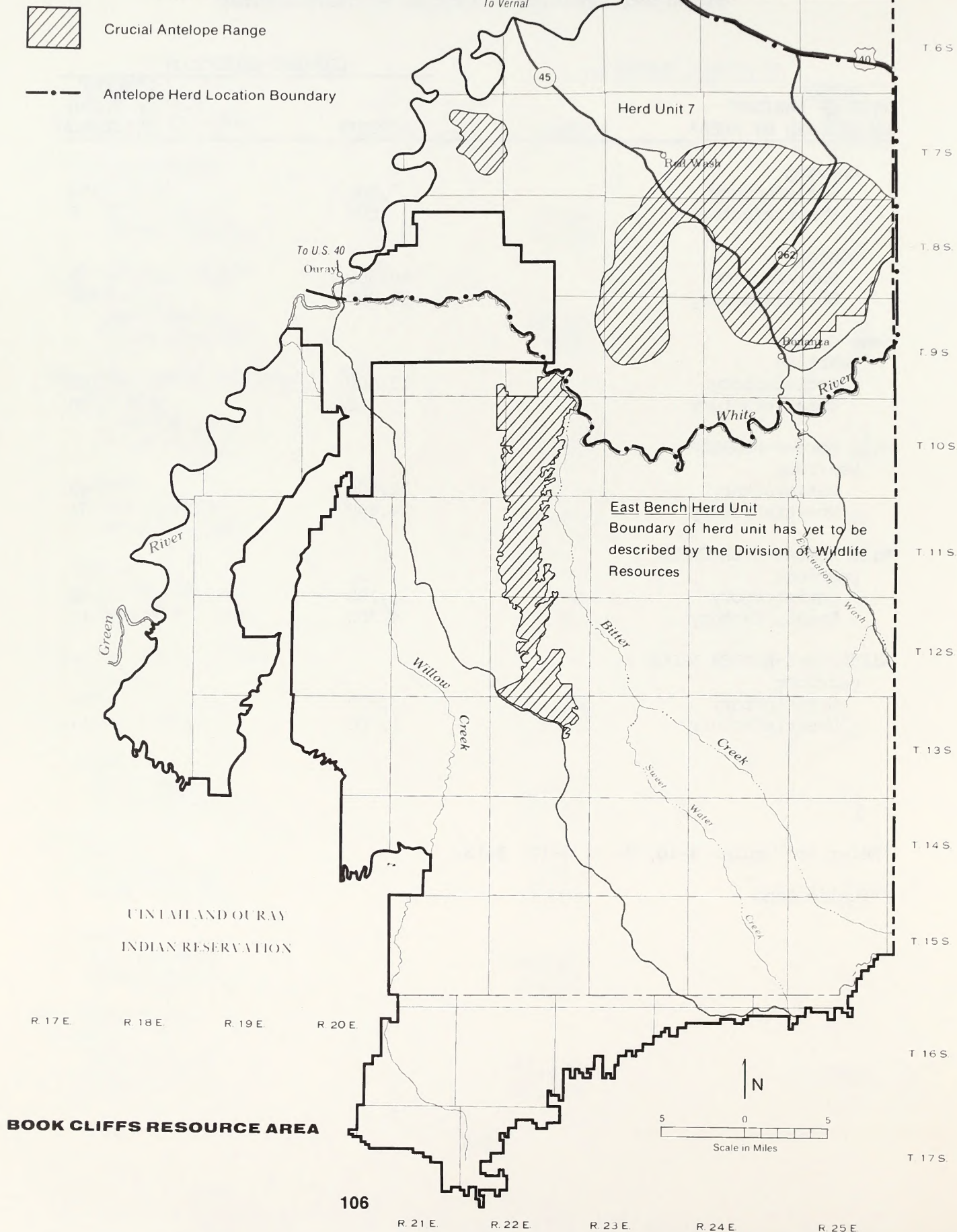
\*Refer to Figures 3-10, 3-11, 3-12, 3-13.

\*\*Public Land



# **ANTELOPE HERD LOCATIONS AND CRUCIAL HABITAT**






**Figure 3 - 10**

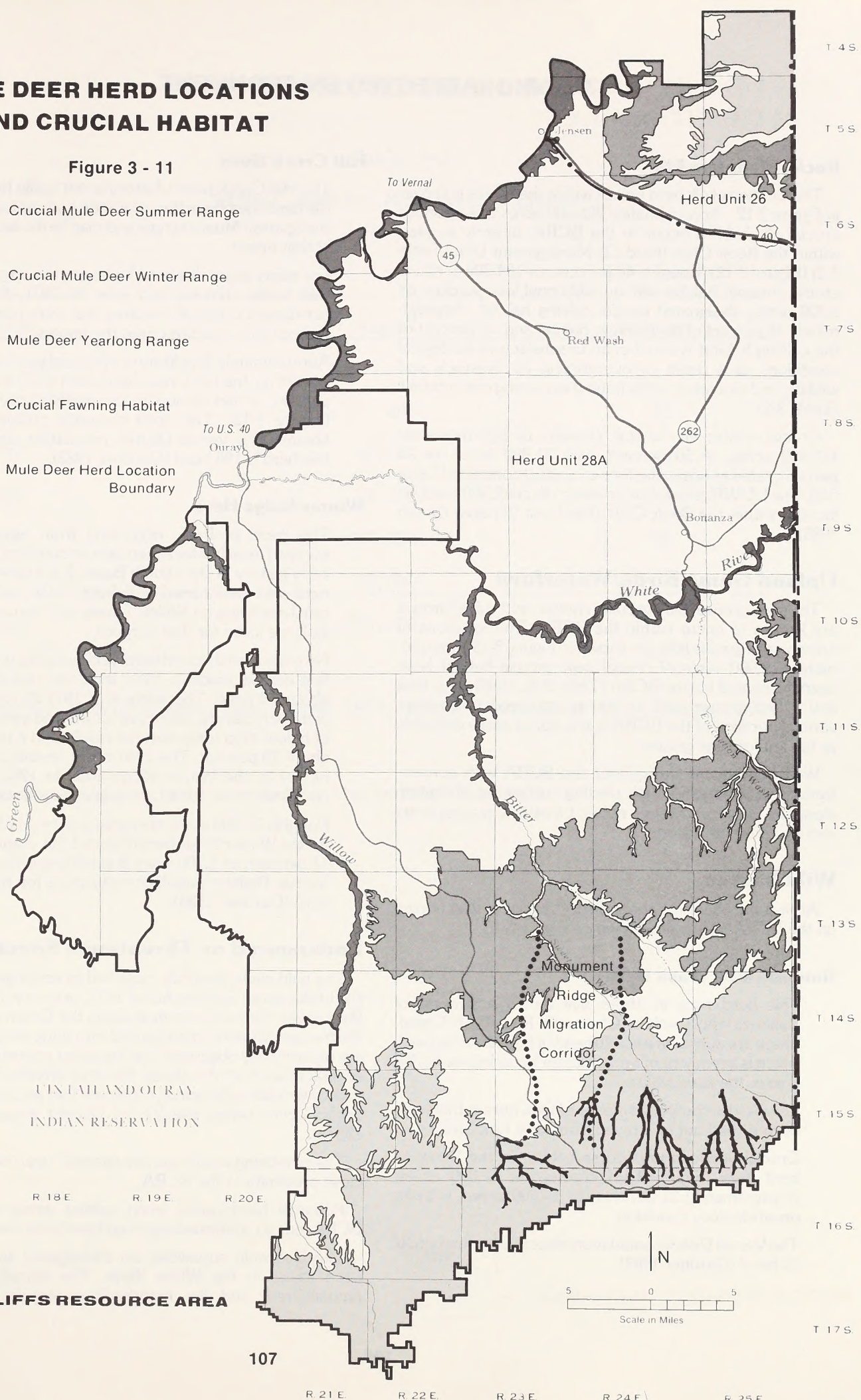




# MULE DEER HERD LOCATIONS AND CRUCIAL HABITAT

Figure 3 - 11

-  Crucial Mule Deer Summer Range
-  Crucial Mule Deer Winter Range
-  Mule Deer Yearlong Range
-  Crucial Fawning Habitat
-  Mule Deer Herd Location Boundary





## CHAP. 3 - AFFECTED ENVIRONMENT

### Rocky Mountain Elk

The location of elk herd unit 21 within the BCRA is shown in Figure 3-12. Approximately 225,000 acres of seasonally crucial elk habitat occur in the BCRA, entirely located within the Book Cliffs (herd 21) Management Unit (Table 3-2) (Figure 3-12). Roughly 46 percent, or 104,300 acres, is crucial summer habitat with an additional four percent, or 8,300 acres, designated crucial calving habitat. Approximately 18 percent of the summer habitat and six percent of the calving habitat is rated in an unsatisfactory ecological condition, as a result of overgrazing by livestock and wildlife, and as a result of the habitat becoming over-mature (Table 3-2).

Crucial winter elk habitat consists of approximately 112,400 acres, or 50 percent, with 31,900 acres, or 28 percent, rated as unsatisfactory ecological condition (Table 3-2). The UDWR population goals for elk are 2,300 head, all located within the Book Cliffs (herd unit 21) area (Smith 1983).

### Upland Game Birds/Waterfowl

The sage grouse, blue grouse, chukar, and ruffed grouse are known to occur within the BCRA. The locations of known sage grouse leks are shown in Figure 3-13. Approximately 12,000 acres of crucial sage grouse habitat have been delineated for the BCRA (Table 3-2). Habitat for blue and ruffed grouse, and chukar is scattered throughout various portions of the BCRA and is not as easily definable as habitat for sage grouse.

Waterfowl occur throughout the BCRA with concentrations of goose and duck nesting and winter utilization along the Green and White rivers. Livestock grazing limits nesting cover for waterfowl.

### Wild horses

At present, there are three distinct herds of wild horses on the BCRA. They are shown on Figure 3-13.

#### Bonanza-Red Wash Herd

This herd runs in about five bands northwest of Bonanza and south of Chevron's Red Wash Camp. There are approximately 40 head of horses in this herd, which is a remnant of a much larger herd that ran in this area in the early 1900's.

This herd is composed mostly of feral horses that have been turned out or strayed from local ranchers.

Crucial yearlong wild horse habitat in the Bonanza herd area (Figure 3-13) consists of 47,300 acres. Approximately 31 percent, or 14,800 acres, is in an unsatisfactory condition.

The Vernal District population objective for this herd is 50 head (Gardner 1983).

#### Hill Creek Herd

The Hill Creek herd's history is not really known, but the herd does show the coloration and conformation of the Spanish Mustang type and may be the last remnant of that breed.

For many years this herd had been the target of local wild horse chasers; and prior to 1971, there were permanent camps in the area that were used as base camps from which to chase the horses.

Approximately 35,400 acres of crucial yearlong habitat occurs for the Hill Creek herd, with 4,300 acres, or 12 percent, of that amount in an unsatisfactory condition (Figure 3-13). The herd currently consists of 158 horses. The Vernal District population objective for this herd is 195 head (Gardner 1983).

#### Winter Ridge Herd

This herd probably originated from horses which escaped from Native Americans or ranchers during the early history of the Uintah Basin. It is known that this herd was maintained and kept "bred up" by local ranchers living on Willow Creek who turned blooded stallions loose for that purpose.

No official herd record was ever kept prior to 1977. The first record, made in 1977, indicated that there were about 40 head. The winters of 1977-78 and 1978-79 were very severe, and deep snows and several weeks of below zero temperatures resulted in a herd loss of about 70 percent. The 1980 count revealed only eight horses in the Winter Ridge area. In 1982, the herd consisted of six adults and two colts (Gardner 1983).

Roughly 15,200 acres of crucial yearlong habitat exists for the Winter Ridge herd (Figure 3-13). Approximately 11 percent, or 1,700 acres is rated unsatisfactory. The Vernal District population objective for this herd is zero (Gardner 1983).

### Endangered or Threatened Species

The bald eagle, federally classified as endangered under the Endangered Species Act of 1973, occurs in the BCRA. Bald eagles are fairly common along the Green and White Rivers during winter months and into early spring. Eagles are occasionally observed in white-tailed prairie dog towns several miles from the rivers. National Wildlife Federation midwinter bald eagle surveys indicate that an average of 45 eagles occur within the Vernal District annually (BLM 1983d).

The whooping crane has occasionally been observed in close proximity to the BCRA.

Potential blackfooted ferret habitat exists within the BCRA, but no confirmed sightings have been made to date.

The Colorado squawfish, an endangered species, has been found in the White River. The humpback chub (endangered) and the razorback sucker (a candidate



### CHAP. 3 - AFFECTED ENVIRONMENT

Table 3-3

#### Visual Resource Management Classes

Class	Acres <sup>a</sup>	Percent
I	400	§1
II	45,000	4
III	74,600	7
IV	932,000	86
V	28,000	3
Total	1,080,000	






Source: Environmental Associates 1979; Flores Associates 1979; Saupe 1981.

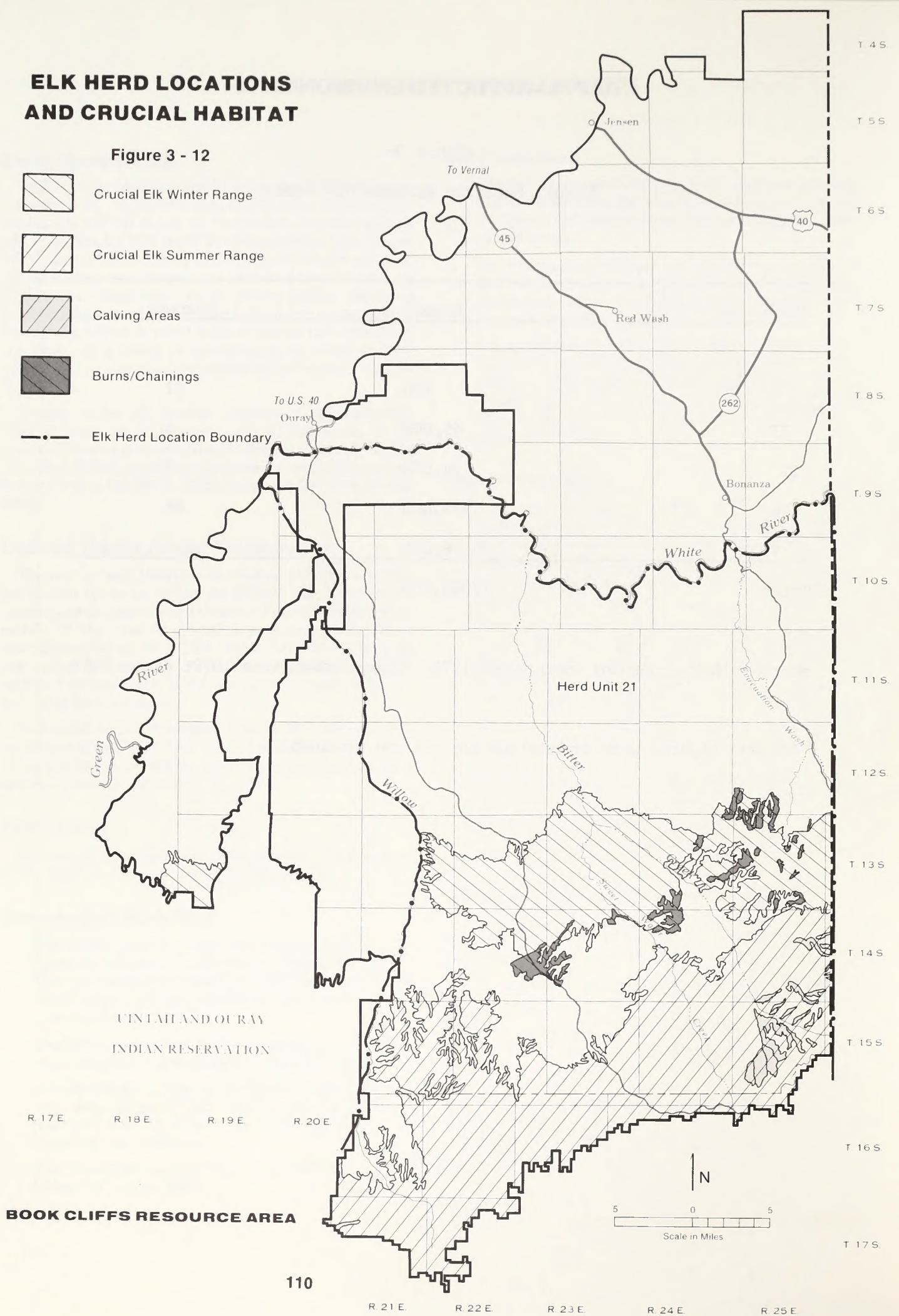
<sup>a</sup>Acreage figures were rounded to the nearest hundred.



# ELK HERD LOCATIONS AND CRUCIAL HABITAT

Figure 3 - 12

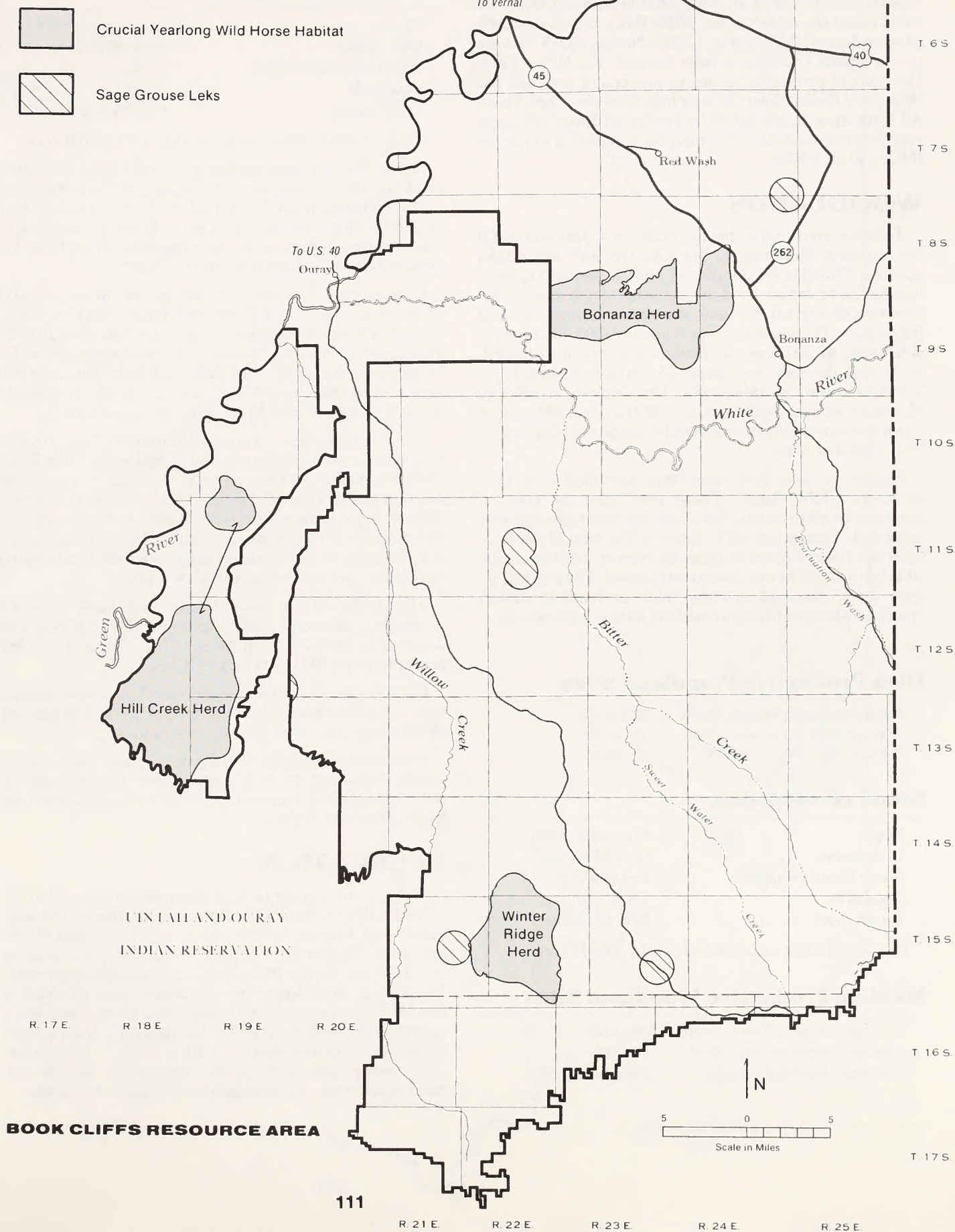
-  Crucial Elk Winter Range
-  Crucial Elk Summer Range
-  Calving Areas
-  Burns/Chainings
-  Elk Herd Location Boundary





# WILD HORSE CRUCIAL YEARLONG HABITAT AND SAGE GROUSE LEKS

Figure 3 - 13





## CHAP. 3 - AFFECTED ENVIRONMENT

species for listing) may occur in the White River. There is a reported capturing of an adult squawfish more than 130 miles above the mouth of the White River, but no evidence of reproduction (Miller, et al. 1982a). No razorback suckers or humpback chubs have been located. The White River Dam would present a barrier to movement between the White and Green Rivers at river mile 50 of the White River. All three species are found in the Green River, although reproductive success of the razorback sucker is unknown (Miller, et al. 1982b).

### WOODLANDS

Total forested land within the BCRA is 410,600 acres. Of this amount, 80,100 acres are forested with timberland species: Douglas fir, ponderosa pine, aspen and cottonwood. The timbered areas are considered non-suitable for commercial harvest because of extreme topography and fragile soils. The woodland type consists of 306,400 acres, of which only 47,200 acres are classified as productive woodlands and desirable for fuelwood harvest (Figure 3-14). Principle species include pinyon, Utah juniper, and Rocky Mountain juniper. Approximately 24,100 acres of forested lands are unavailable for woodland management because of their resource uses.

Productive woodland sites were identified in a 1981 inventory (BLM 1982). These sites have the greatest potential for management because they have higher growth rates and volumes per acre, slopes of less than 25 percent, have not been chained or recently burned, and are accessible by road, paths or cross country travel. The productive sites were classified as either high or medium. Stand characteristics for high and medium sites are as follows:

#### High Productive Woodland Sites

Average volume per acre, green	10.5 cords
Average volume per acre, dead	1.6 cords
Estimated maturation period	125 years

#### Stand composition:

Pinyon	40 percent or more
Utah juniper	Up to 60 percent
Rocky Mountain juniper	1 percent
Douglas fir	1 to 10 percent
Crown cover	20 to 65 percent

High productive woodland sites total 34,100 acres.

#### Medium Productive Woodland Sites

Average volume per acre, green	7.5 cords
Average volume per acre, dead	1.0 cords
Estimated maturation period	150 years

#### Stand composition:

Pinyon	15 percent or more
Utah juniper	Up to 85 percent
Rocky Mountain juniper	None
Douglas fir	None
Crown cover	10 to 45 percent

Medium productive woodland sites total 13,100 acres.

Nonproductive sites are composed of stands that grow on slopes with grades over 25 percent, are nonaccessible, or contain volumes of less than five cords per acre. Most nonproductive sites are found at the lower elevations and contain trees too small to be considered acceptable for firewood harvest. Total acreage is 259,200.

Cottonwood, *Populus fremontii*, grows on some 3,000 acres along the Green River and White River bottoms. Growth is rapid as trees reach a diameter breast height of 24 inches within 65 years. Volume per acre is estimated to be 15 cords for stands reaching maturity. Approximately 300 acres, along the Green River, are accessible for management. Trees along the White River are inaccessible.

Douglas fir grows in even-aged stands on the north and east side slopes and covers some 71,600 acres in the Book Cliffs Mountains. Volume per acre averages 20 cords and rotation age is about 150 years. Most stands are inaccessible and grow on slopes with grades over 25 percent. Although these stands are not regarded as commercial, up to 4,000 acres could be utilized as fuelwood without creating significant conflicts to watershed or wildlife.

The number of sale and free use permits have increased in the past decade. In 1972, approximately 250 cords of wood were sold or given away. Total harvest in 1982 amounted to 2,200 cords in the BCRA.

Demand for firewood has increased as home heating costs have increased. In the Uintah Basin, about 65 percent of the homes use wood as a heating source.

A segment of the wood burning public prefers pinyon and juniper fuel wood. In the Roosevelt and Vernal areas, the only dependable public source of this type of wood is from BLM administered lands.

### RECREATION

There is only one recreation management unit within the entire BCRA, the Book Cliffs Extensive Recreation Management Area. Limited facilities have been developed at two locations: Musket Shot Spring, a road-side pullover along U.S. Highway 40, and PR Spring, a semi-primitive campsite. The Musket Shot Spring site was constructed as a part of the 1976 Bicentennial Celebration and commemorates a segment of the Escalante Trail traveled by the Spanish Missionaries Dominguez and Escalante, in September 1776. Some vandalism of the interpretive signing and dumping of trash are management problems at the site.



# PRODUCTIVE WOODLAND MANAGEMENT AREAS

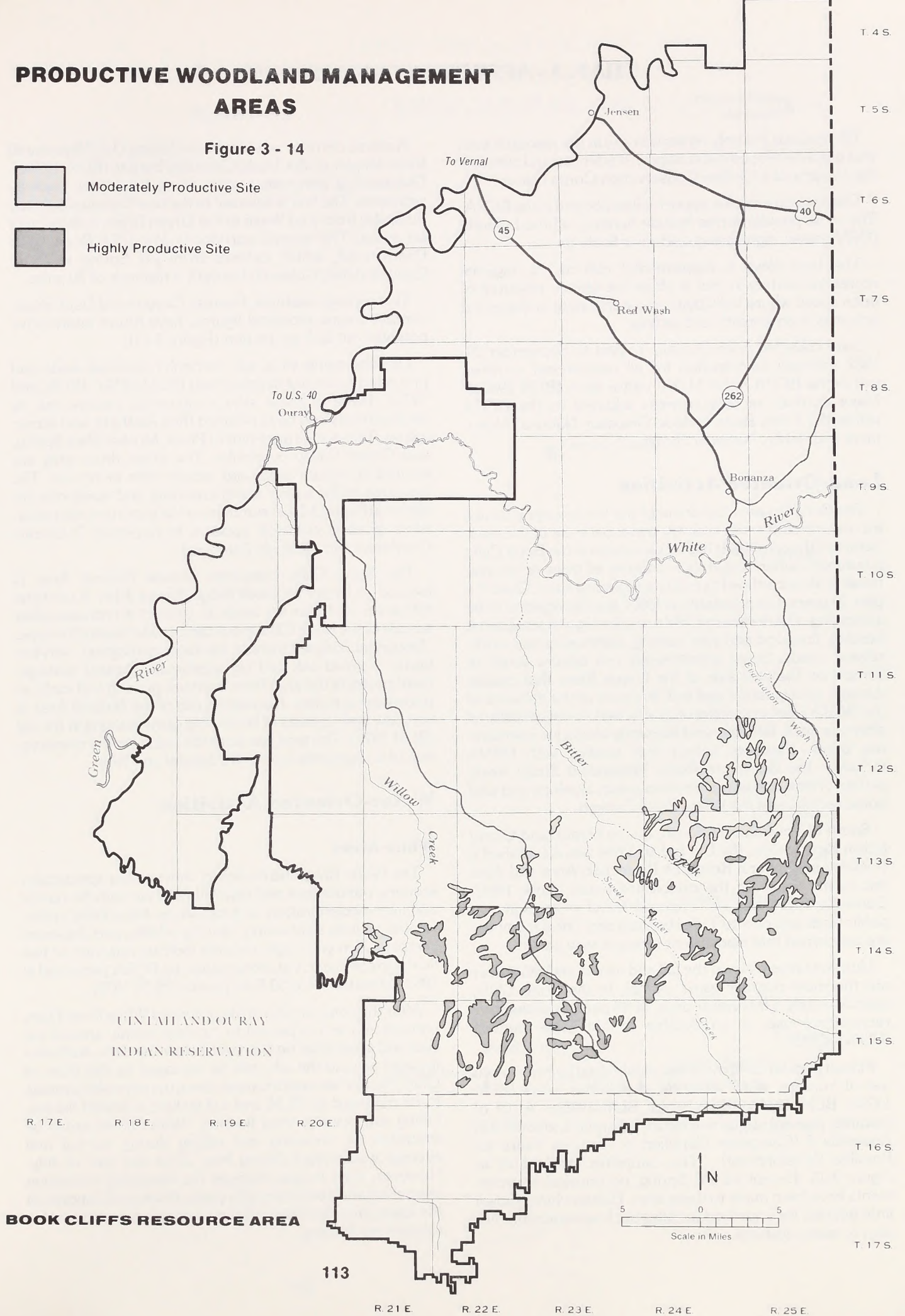
Figure 3 - 14



Moderately Productive Site



Highly Productive Site





## CHAP. 3 - AFFECTED ENVIRONMENT

PR Spring is the only recreation site in the resource area that has a developed water supply. It is fenced and contains the remains of a Civilian Conservation Corps Camp.

Dispersed recreation opportunities abound in the BCRA. The most popular forms include hunting, off-road vehicle (ORV) travel, sightseeing, and river floating.

The land plays a supplemental role in the regional recreation setting in that it offers the unique resource of open space where individuals can participate in dispersed activities in an unrestricted setting.

Data collected from October 1, 1981 to September 30, 1982 estimate participation for all recreational activities within the BCRA to be 14,000 visitor days (BLM 1983e). Major outdoor recreation areas adjacent to the BCRA within the Uinta Basin include Dinosaur National Monument and Ashley National Forest.

### Land-Oriented Activities

The Bonanza area has some of the better opportunities for unrestricted cross country travel because of the open nature of the terrain. At higher elevations in the Book Cliffs mountains, where vegetation consists of trees or shrubs, travel is often confined to existing trails and ways. Over the past 10 years, the popularity of ORV activity appears to be increasing. The dominant ORV use is for big and small game hunting, firewood and post cutting, sightseeing and work-related needs. Some spontaneous use occurs south of Jensen on the east side of the Green River that causes damage to vegetation and soil. Because of the distance of the BCRA from population centers, and the availability of alternate sites, little demand presently exists for intensive-use areas. Resource values that conflict with ORV's include: the Boulevard Ridge Watershed Study Area, certain critical and severe erosion areas, antelope and wild horse ranges, and the White River Canyon.

South of Township 11 South, on the Uintah and Ouray Indian Reservation, the Ute Indian Tribe has established a Wildlife and Cultural Resource Protection Area and does not permit travel off the established roads (Core 1984). Currently, BLM has not imposed travel restrictions on public lands adjacent to Tribal borders and Tribal members are concerned that inadvertent trespass may occur.

Hunting takes place in the fall and winter and mule deer are the most popular game animal. In the Book Cliffs, approximately 6,800 visitor days, or 48 percent of the total recreational use, is attributable to big game hunting (UDWR 1983).

Fifteen popular camping areas, established by impromptu use of hunters, were set aside in previous years (BLM 1973b; BLM 1974b; BLM 1974d; BLM 1975). A list of features, present status and future potential is identified in Appendix 6 (Campsites Identified in Previous Years for Possible Development). The campsites are located in Figure 3-15. Except for PR Spring, no physical improvements have been made to these sites. Hunters have shown little interest for improved facilities such as sanitation, fire pits, or water systems.

A scenic corridor was established along U.S. Highway 40 from Jensen to the Utah/Colorado border (BLM 1974b). Outstanding panoramas exist along two other highway segments. The first is adjacent to the new Bonanza highway (Utah 45) from Red Wash to the Green River, a distance of six miles. The second corridor is along the Book Cliffs Divide road, which extends from PR Spring to Fatty Canyon (Utah/Colorado border), a distance of 20 miles.

Two geologic features, Fantasy Canyon and Duck Rock, contain unique erosional figures, have future interpretive potential but lack protection (Figure 3-15).

Like the camp sites, six overlooks were set aside and protected for future development (BLM 1974a, 1974b, and 1975). Three of these sites continue to receive use by recreationists and have retained their aesthetic and scenic values. These sites are Point of Pines, Musket Shot Spring, and Grand Valley overlooks. The other three sites are located in remote areas and receive little or no use. The locations of the scenic travel corridors and overlooks are shown in Figure 3-16. A summary of the important characteristics of each overlook appears in Appendix 7 (Scenic Overlooks and Geologic Features).

The Book Cliffs Mountain Browse Natural Area is located on Upper McCook Ridge (Figure 3-16). It contains 400 acres and was set aside to protect a representative sample of the Book Cliffs mountain browse vegetation type.

Dominant species include birchleaf mahogany, serviceberry, Gambel oak and big sagebrush. Present management protects the area from livestock grazing and surface-disturbing activities. Recreation use of the Natural Area is very low and consists of limited big game hunting in the fall (BLM 1975). The area has scientific value for the preservation of a vegetative type in its natural condition.

### Water-Oriented Activities

#### White River

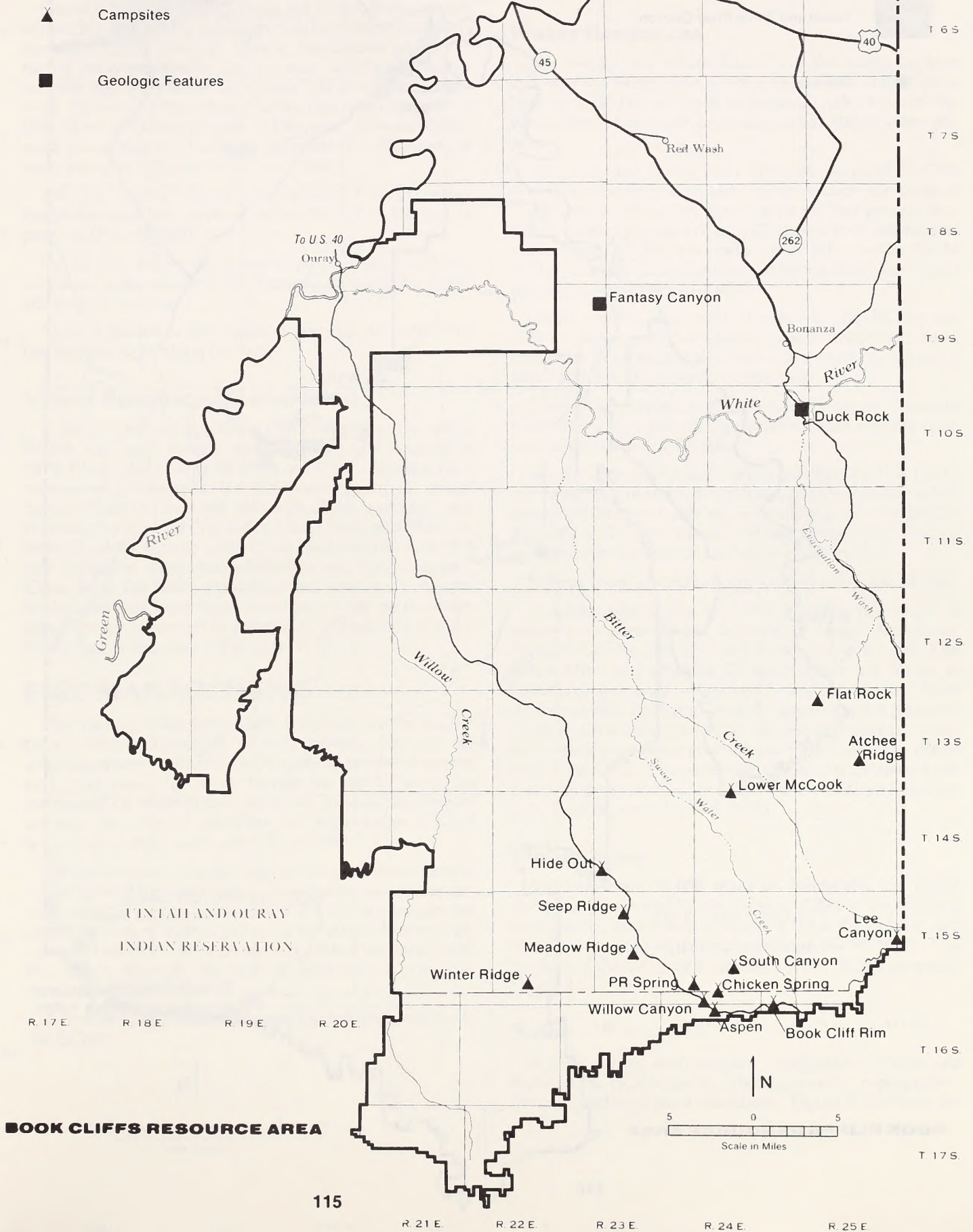
The White River and its desert canyon offer spectacular scenery, remoteness, and relatively safe currents for novice and intermediate rafters and canoeists. Associated opportunities include sightseeing, viewing wildlife, and dispersed camping. Ten years ago, records indicate only one or two float trips per year; but, observation by BCRA personnel in 1983 estimated 40 to 50 float parties (BLM 1973).

After the construction of the proposed White River Dam, recreation use is expected to increase mainly around the lake and somewhat on the river below the dam. Activities focused around the lake will be managed by the State of Utah. Recreation opportunities along the river will continue to be managed by BLM and will include a limited fishery, hiking and possibly river floating. Water flows would be adequate for canoeing and rafting during normal and average water years during May, June and part of July. However, from August through the remaining recreation use period and during drought years, flows would approach the lower limit necessary and may even be inadequate for satisfactory floating.



# CAMPSITES AND GEOLOGIC FEATURES

Figure 3 - 15





# SCENIC TRAVEL CORRIDORS, OVERLOOKS WHITE RIVER CANYON AND BOOK CLIFFS MOUNTAIN BROWSE NATURAL AREA

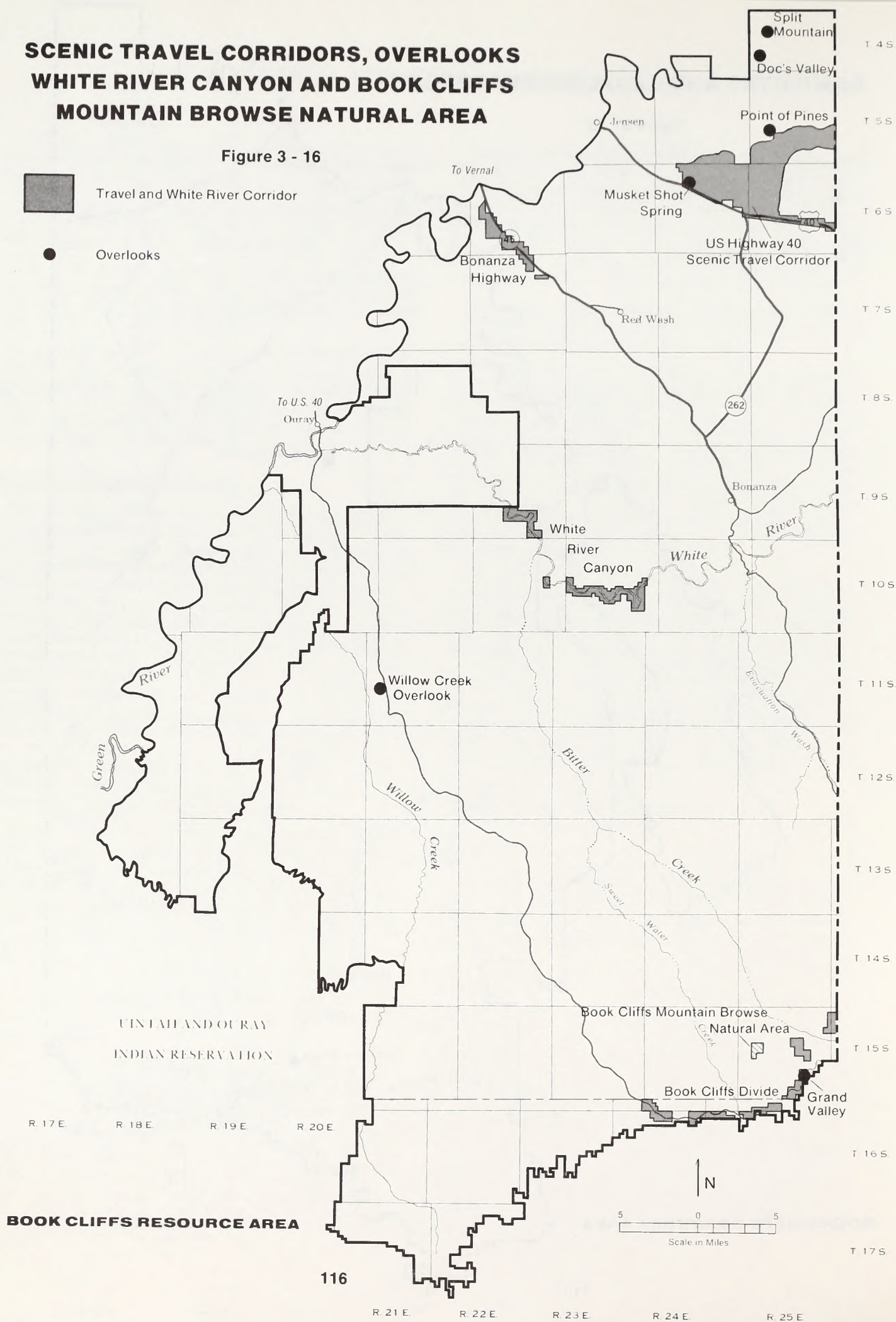
Figure 3 - 16



Travel and White River Corridor



Overlooks



BOOK CLIFFS RESOURCE AREA



## CHAP. 3 - AFFECTED ENVIRONMENT

### Green River

Recreation opportunities along the Green River consist of river floating, fishing for channel catfish, and limited deer, duck, and goose hunting. Fishing has proven popular in recent years and during the summer months, estimates indicate that there would be at least 100 recreationists per week (Cranney 1983). Most floatboating takes place from Split Mountain Campground at Dinosaur National Monument downstream to the town of Jensen. In 1982, permits were issued to 220 people (Davies 1983).

The river segment from Ouray to Sand Wash (31 miles) has limited popularity and use ranges from 50 to 150 people per year (Kenna 1983).

Hunting for ducks and geese along the river sand bars, and deer in the cottonwood bottoms, accounts for some 400 visitors per year.

There is limited public access to the river and no visitor use facilities exist along the river.

### Visual Resource Management

A visual resource inventory and analysis for the entire BCRA has been completed (Environmental Associates 1979; Flores Associates 1979; Saupe 1981). Management classes, which describe the different degrees of modification allowed to the basic elements of the landscape, are tabulated by acreage (Table 3-3, Visual Resource Management Classes). Management Class I is the most restrictive and applies to designated wilderness and natural areas. Class V is the least restrictive and applies to natural landscapes that have been disturbed to the point where rehabilitation is needed to restore it. The location of each VRM class is depicted in Figure 3-17.

### FIRE MANAGEMENT

Fire management techniques employed in the BCRA have primarily consisted of extinguishing any and all wildfires, wherever they occur, in order to protect property and other resource values. During the last 11 years, an average of 7.6 wildfires have occurred annually, burning an average area of 18.2 acres per fire. An average of 137.4 acres have burned each year (Glenn 1983).

Limited amounts of prescribed burning have been carried out in the BCRA in recent years. These vegetation manipulation projects have concentrated on mature sagebrush canyon bottoms located primarily in crucial deer and elk summer habitats. These projects provided increased wildlife access through the canyon bottoms and, overall, increased forage quality.

A modified suppression program has not been initiated in the BCRA.

## WATERSHED

### Water Resources

The Green and White Rivers are the major surface waters of the BCRA. The average annual flow of the Green River is 3,120,000 acre-feet at Jensen, Utah. Flow of the White River at its mouth has averaged 457,900 acre-feet per year.

The proposed White River Dam would store 109,250 acre-feet, creating a reliable water source for mineral development. Mitigation agreements for that project provide a minimum release of 203,625 acre-feet during normal water years to support endangered fish species (BLM 1982e). Current depletions on the White River are 37,000 acre-feet per year (BLM 1982a).

Other smaller, perennial streams in the BCRA are Willow, Bitter, and Evacuation creeks. Insufficient flows and a lack of storage make them less suitable as potential water supplies for mineral development.

Salinity is a concern in all waters of the upper Colorado River Basin, although no highly saline water sources have been identified in the BCRA.

Several springs and seeps which are important for public use have been protected by designating them public water reserves. Nineteen public water reserves exist in the BCRA (Figure 2-6). These areas receive special consideration and protection in the mineral leasing category system.

No municipal watersheds are located within the BCRA.

Ground water in the BCRA is found in two types of aquifers—unconsolidated deposits of recent deposition, primarily stream alluvium, and structural rock units. The Bird's Nest and Douglas Creek aquifers are found in structural rock units above and below the oil shale layer (Holmes 1980). Recharge to all the aquifers in the southern Uinta Basin is estimated to be 120,000 acre-feet per year, and enters the system primarily on alluvial surfaces (Price and Miller 1975). The maximum practical withdrawal from these aquifers is estimated to be about 20,000 acre-feet per year (Lindskov and Kimball 1983).

### Floodplains

Approximately 16,000 acres of floodplains are found along the Green and White rivers and Bitter, Evacuation, Sweetwater, and Willow creeks. Of these floodplains, 470 acres are in poor ecological condition (BLM 1982). The location of the 100-year floodplains in the BCRA appear in Figure 2-6.

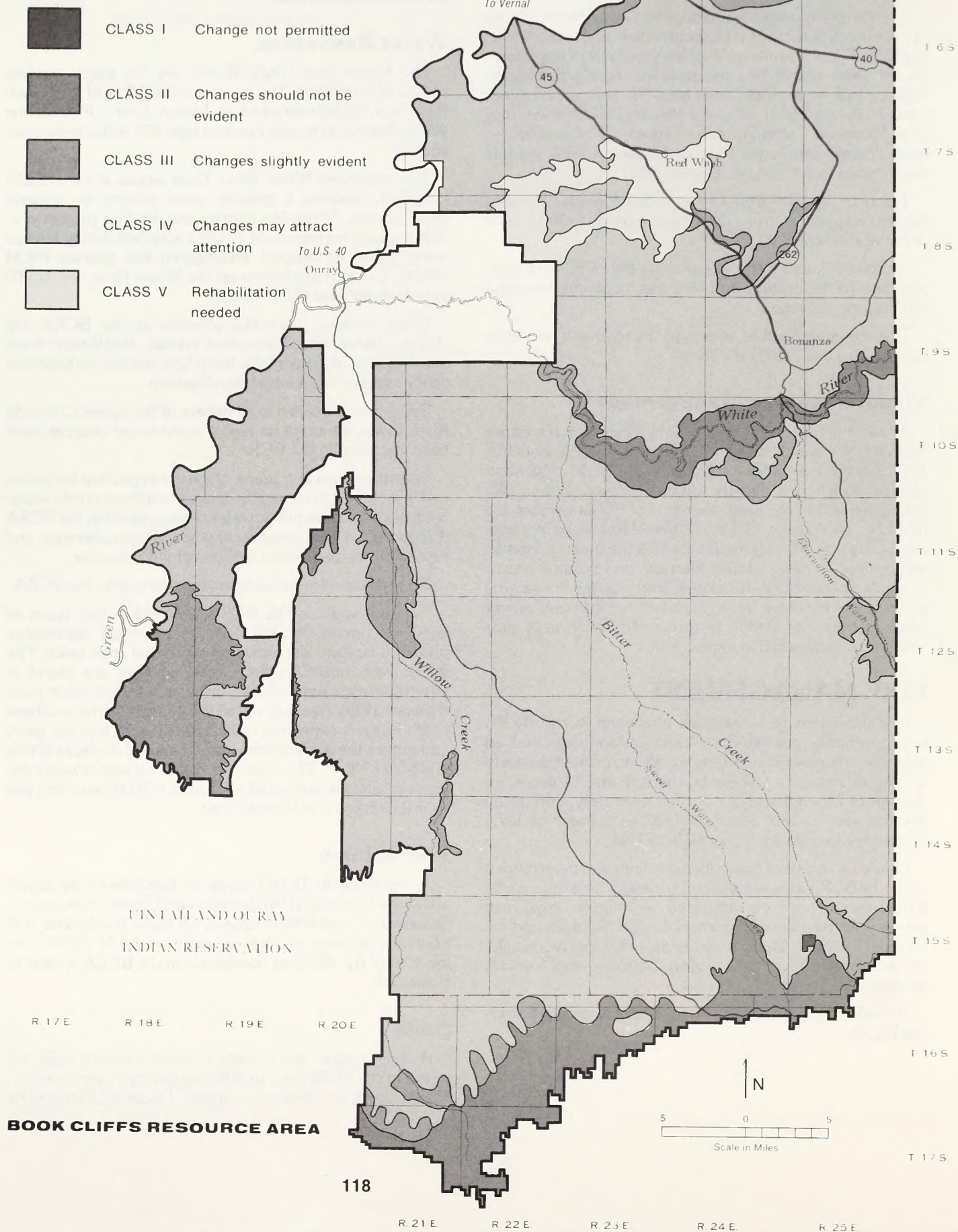
### Soils

A wide variety and complex combination of soils are found in the BCRA due to differing geologic, topographic, climatic, and vegetative conditions. Figure 3-18 shows the



# **VISUAL RESOURCE MANAGEMENT CLASSES (DIFFERENT DEGREES OF ALLOWABLE VISUAL LANDSCAPE CHANGE)**

**Figure 3 - 17**

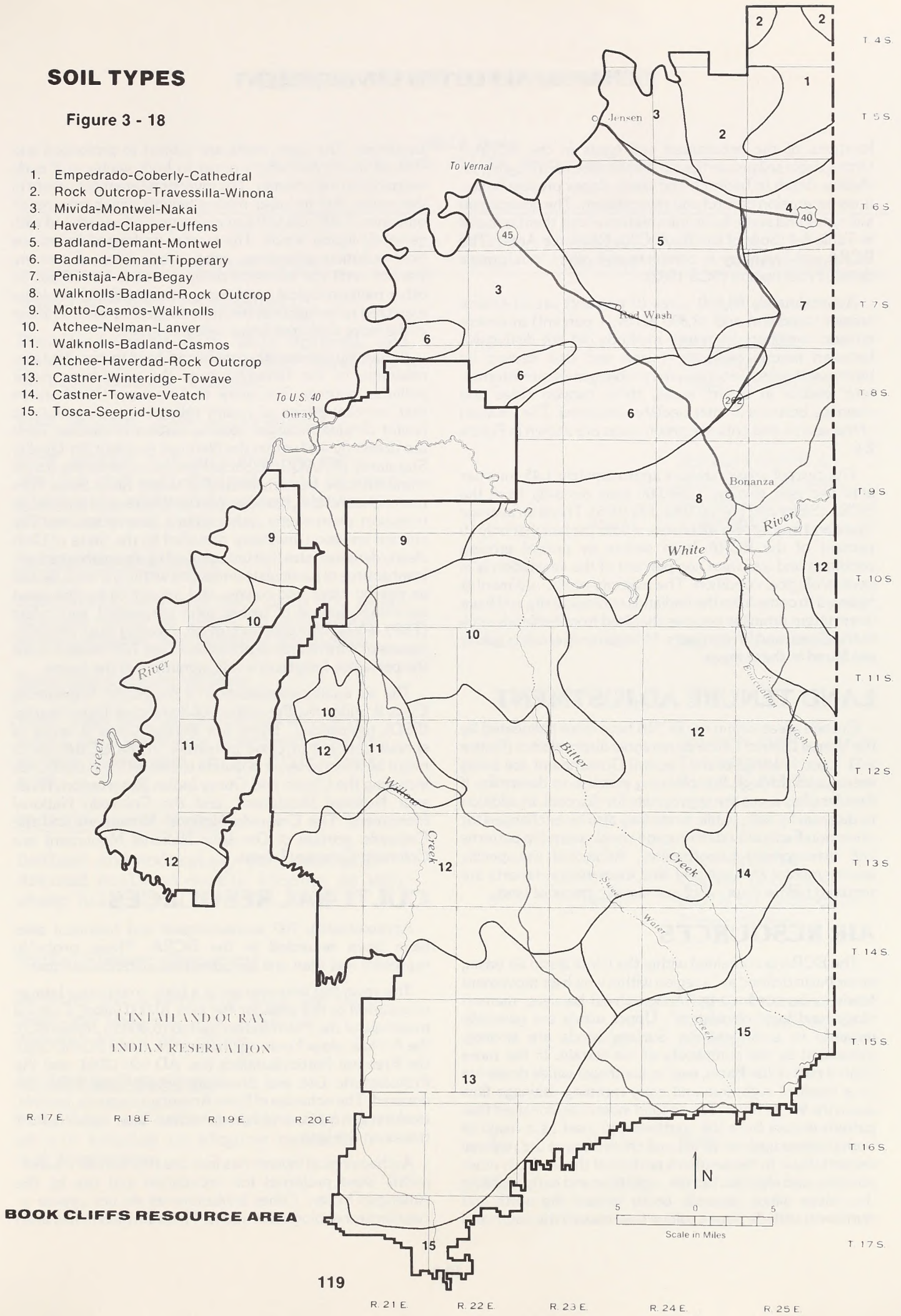




# SOIL TYPES

Figure 3 - 18

1. Empedrado-Coberly-Cathedral
2. Rock Outcrop-Travessilla-Winona
3. Mivida-Montwel-Nakai
4. Haverdad-Clapper-Uffens
5. Badland-Demant-Montwel
6. Badland-Demant-Tipperary
7. Penistaja-Abra-Begay
8. Walknolls-Badland-Rock Outcrop
9. Motto-Casmos-Walknolls
10. Atchee-Nelman-Lanver
11. Walknolls-Badland-Casmos
12. Atchee-Haverdad-Rock Outcrop
13. Castner-Winteridge-Towave
14. Castner-Towave-Veatch
15. Tosca-Seeprid-Utso





## CHAP. 3 - AFFECTED ENVIRONMENT

locations of the generalized soil types in the BCRA. Unfavorable soil properties such as surface rock fragments, shallow depth to bedrock and steep slopes present limitations for erosion control and revegetation. The generalized soil types and some basic information about them is found in Table 3-4 (Soils of the Book Cliffs Resource Area). The BCRA soil inventory is complete and offers much more detailed information (SCS 1982).

Approximately 98,800 acres (9 percent) are in critical erosion condition and 12,300 acres (1 percent) in severe erosion condition. Inventory methods did not distinguish between natural geologic erosion and that caused by human activities. Generally, the problem areas are intermittent washes in desert areas, steep canyon sides and drainage bottoms in intermediate elevations. The location of the severe and critical erosion areas are shown in Figure 2-6.

The current erosion rate is approximately 1.45 tons per acre per year totaling 1,566,000 tons annually from the BCRA (Seiler and Tooley 1982; BR 1975). This is an average figure and may appear inconsistent with the fact that only 10 percent of the BCRA is in severe or critical erosion condition and less than two percent of the vegetation is in poor ecological condition. The majority of this sediment is believed to come from the badlands ecological site and from intermittent drainage courses that lead from badlands sites to the Green and White rivers. Most actively eroding gullies are found in these areas.

### LAND TENURE ADJUSTMENT

Certain areas within the BCRA have been delineated by the Vernal District Office as potential disposal sites (Figure 2-7). Land holdings of the Federal Government are being reanalyzed through this planning process to determine if the identified areas are appropriate for disposal. In addition to disposal by sale, public lands may also be exchanged for other non-Federal lands to improve landownership patterns and management opportunities. Additional site-specific environmental analyses and land examination reports are required before disposal of any specific tracts of land.

### AIR RESOURCES

The BCRA is contained within the Uinta Basin air basin, an air basin defined as "a region within which air movement tends to be confined by topographical barriers, meteorology, and local circulation". Upper winds are generally westerly to southwesterly. Surface winds are strongly influenced by the complexity of the terrain. In the more central part of the Basin, east to southeast winds dominate as a result of nighttime and early morning drainage flow down the White River. The second most common wind flow pattern occurs from the southwest to west as a result of both daytime upslope winds and channeling of the regional westerly flow. In the southern portion of the Basin, in more complex and elevated terrain, nighttime and early morning downslope winds generally occur toward the north and northwest with daytime upslope flow toward the south and

southeast. The basin areas are subject to prolonged and intense inversions which occur in both winter and early mornings in the summer. The inversions are most severe in the winter due to lower mixing heights which may reach only from 3,000 to 4,000 feet above ground associated with generally lighter winds. The strong, prolonged inversions hold pollution emissions, creating a buildup of concentrations until the inversion dissipates or is forced out by other meteorological conditions. Mixing heights would be expected to be higher in the more rugged terrain and lower in the more sheltered lower valley locations.

Air quality is presently considered good to excellent as a reflection of the remoteness of the area from major pollutant sources. The work of Aerocomp (1983) shows that concentrations of health related criteria pollutants (sulfur dioxide, nitrogen oxides, carbon monoxide, lead) are presently well within the National Ambient Air Quality Standards (NAAQS). Concentrations close to the ozone standard have been measured at White River Shale Oil's tracts U-a and U-b, but appear to be the result of long range transport phenomena rather than a nearby source. The current emission inventory provided by the State of Utah clearly demonstrates that unimproved roads are the predominant source of particulate emissions within the area, as well as nearby cities and towns, and appear to be the most significant source of higher total suspended particulate (TSP) levels. Naturally occurring, blowing dust probably causes or contributes to occasional high TSP levels but not the pervasive long-term levels monitored in the towns.

The air quality classification of the BCRA is presently Class II under the Prevention of Significant Deterioration (PSD) regulations. There are several Class II areas of special concern in close proximity to the BCRA which might be affected by air pollution transport from the BCRA including the Uintah and Ouray Indian Reservation, Dinosaur National Monument, and the Colorado National Monument. The Colorado National Monument and the Colorado portion of Dinosaur National Monument are Colorado Category I areas.

### CULTURAL RESOURCES

Approximately 700 archaeological and historical sites have been recorded in the BCRA. These probably represent less than one percent of the potential number.

The recorded sites represent a fairly continuous human occupation of this area for the past 10,000 years. Cultural materials of the Paleo-Indian period (6,000 to 10,000 BC), the Archaic stage hunter-gatherers (ca. 6,000 BC-AD 350), the Fremont horticulturalists (ca. AD 950-1200), and the Protohistoric Ute and Shoshoni people have been discovered. The activities of Euro-American trappers, traders, explorers, miners, and homesteaders have also left their traces on the land.

Archaeological inventories indicate that certain environments were preferred for occupation and use by the American Indian. Other environments do not appear to contain archaeological remains. This information has been



## CHAP. 3 - AFFECTED ENVIRONMENT

Table 3-4  
Soils of the Book Cliffs Resource Area

Soil/Type Description	Percent of the BCRA	Slope (Percent)	Limitations
<u>Empedrado-Coberly-Cathedral</u>			
Shallow to very deep, well drained, and gently sloping to moderately steep soils on Blue Mountain Plateau.	1	4-25	Surface rock fragments. Depth to bedrock.
<u>Rock Outcrop-Travessilla-Winona</u>			
Rock outcrop and very shallow and shallow and well-drained soils on gently sloping to moderately steep mountain sideslopes and valleys.	3	4-25	Shallow depth to bedrock. Slopes. Surface rock fragments.
<u>Mivida-Montwel-Nakai</u>			
Moderately deep and very deep and well-drained soils on level to moderately steep summits and eroding shoulders.	6	1-25	Depth to bedrock.
<u>Haverdad-Clapper-Uffens</u>			
Very deep and well-drained soils on level to moderately steep valleys and valley sideslopes in the Cliff Creek area.	2	0-25	Surface rock fragments. Slope. Alkali.
<u>Badland-Demant-Montwel</u>			
Badland and moderately deep and well-drained soils on gently sloping to very steep hillslopes.	5	4-90	Very fragile. Clayey textures. Depth to bedrock. Steep slopes.
<u>Badland-Demant-Tipperary</u>			
Badland and moderately deep and very deep and well-drained soils on eroding hills and dunes.	6	1-25	Clayey textures. Depth to bedrock. Fragile.
<u>Penistaja-Abra-Begay</u>			
Very deep and well-drained soils on gently sloping to sloping terraces and toeslopes.	2	3-15	None



## CHAP. 3 - AFFECTED ENVIRONMENT

Table 3-4 (Continued)

Soil/Type Description	Percent of the BCRA	Slope (Percent)	Limitations
<u>Walknolls-Badland-Rock Outcrop</u>			
Very shallow and well-drained soils on nearly level to very steep hillslopes.	11	2-90	Depth to bedrock. Slope. Sixteen percent of Walknolls soil is in severe or critical erosion condition.
<u>Motto-Casmos-Walknolls</u>			
Very shallow and shallow and well-drained soils on nearly level to very steep hillslopes of lower Willow Creek.	4	2-50	Excess sodium. Depth to bedrock. Surface rock fragments. Nine percent of Motto soil is in severe erosion condition.
<u>Atchee-Nelman-Lanver</u>			
Very shallow to moderately deep and well-drained soils on nearly level to steep hillslopes and drainages.	7	2-50	Depth to bedrock. Surface rock fragments. Twenty percent of Atchee soil is in critical erosion condition.
<u>Walknolls-Badland-Casmos</u>			
Very shallow and shallow and well-drained soils on nearly level to very steep plateaus and hillslopes.	8	2-50	Depth to bedrock. Surface rock fragments.
<u>Atchee-Haverdad-Rock Outcrop</u>			
Very shallow, shallow and very deep and well-drained soils on nearly level to very steep upland hillslopes and drainages.	21	2-80	Depth to bedrock. Surface rock fragments. Steep slopes. Twenty percent of Atchee soil is in critical erosion condition.



## CHAP. 3 - AFFECTED ENVIRONMENT

Table 3-4 (Continued)

Soil/Type Description	Percent of the BCRA	Slope (Percent)	Limitations
<u>Castner-Winteridge-Towave</u>			
Shallow, very shallow and very deep, and well-drained soils on plateaus, summits, and hillslopes.	8	1-70	Slope. Depth to bedrock.
<u>Castner-Towave-Veatch</u>			
Very shallow to very deep, and well-drained soils on sloping to very steep plateaus, shoulders, and backslopes.	7	8-80	Slope. Depth to bedrock.
<u>Tosca-Seeprid-Utso</u>			
Deep and well-drained soils on gently sloping to very steep plateau summits and hillslopes.	9	4-80	Slope. Coarse fragments. Depth to bedrock.

Source: Soil Descriptions and Interpretations of Portions of Grand and Uintah Counties, Utah and Garfield and Moffat Counties, Colorado. Soil Conservation Service, Bureau of Land Management, Utah Agricultural Experiment Station. 1982.



## CHAP. 3 - AFFECTED ENVIRONMENT

used to formulate theoretical statements concerning where common types of archaeological sites can usually be found. This has enabled BLM management to protect valuable cultural resource sites and areas while avoiding undue delay in development or use of natural resources.

A recent cultural resource study in the 648 square miles of the BCRA south of the White River revealed that prehistoric sites other than petroglyphs were present in the Utah juniper community and absent from the big sagebrush, pinyon-Utah juniper-Douglas fir-aspen, greasewood, and salt-desert scrub communities. Petroglyphs were most often found in the greasewood and big sagebrush communities. Historic sites were most often found in the greasewood, Utah juniper, and salt-desert scrub communities (Reynolds et al. 1983).

The following types of prehistoric archaeological sites are known in the BCRA:

1. Villages
2. Camps (several subtypes)
3. Resource procurement sites (numerous subtypes)
4. Lithic (stone) tool procurement and processing sites
5. Burials (several subtypes)
6. Rock alignments, stone cairns, rock circles
7. Caches, storage cists, structures
8. Bed rock mortars
9. Hearths (camp fires), ovens (several subtypes)
10. Petroglyphs, pictographs, signatures, scratchings
11. Fremont structural sites
12. Archaeoastronomy sites
13. Unknown function, cultural affiliation sites

The Cocklebur Wash petroglyph site is the only prehistoric site presently listed on the National Register of Historic Places. Three historic sites in the BCRA are listed or considered eligible for inclusion on the National Register of Historic Places. The Ignacio stage stop (destroyed), the White River ferry crossing, and the Uintah Dragon toll road.

Several other historic period sites (1776 to present) are considered significant under the criteria for inclusion on the National Register of Historic Places (36 CFR 800). These are:

1. Dragon, Utah-Private ownership
2. Watson, Utah-Private ownership
3. Rainbow, Utah-Private ownership
4. Gilsonite Railroad-Mixed ownership

Another 10 sites have been determined to have potential for inclusion on the National Register of Historic Places according to criteria listed in 36 CFR 800. These include an excavated cave, a well-preserved homestead, and an early 20th Century oil shale plant. Approximately 27 percent of

the cultural sites in the BCRA have been termed significant; five percent of the total number of sites appear to have the potential for National Register listing (Phillips 1984).

The following types of historic period sites are known in the BCRA:

1. Civilian Conservation Corps reservoirs, dams, structures
2. Cabins and out structures
3. Dams
4. Wagon roads and way stations
5. Ferries
6. Corrals and enclosures
7. Excavations and structures associated with gilsonite mining
8. Prospect holes associated with mining and exploration for gilsonite and shale oil
9. Cemeteries and graves
10. Right-of-way structures, excavations, artifacts associated with the "Gilsonite Railroad"
11. Supporting services structures associated with the "Gilsonite Railroad"
12. Sites, artifacts associated with sheep and cattle ranching
13. Ute rock art sites: Uncompahgre reservation period
14. Ute dwellings and resource acquisition/processing activities
15. Euro-American rock art sites
16. Modern (1930-present) recreation sites
17. Unknown function/ethnic affiliation sites

The archaeological sites associated with human activities during the historic period appear to be oriented toward historical themes. These are:

1. Architecture
2. Civilian Conservation Corps/work project
3. Commerce/industry
  - a. Gilsonite/oil shale mining
4. Engineering
5. Ethnicity
6. Farming/ranching
7. Military/Indian conflict
8. Native American
9. Recreation
10. Transportation: Railroad/stage/ferry
11. Waterworks



## CHAP. 3 - AFFECTED ENVIRONMENT

Most sites in the BCRA are in fair to good condition (greater than 50 percent of their contents undisturbed). Erosion and vandalism are the two most common disturbing factors, followed by excavation/collection (Phillips 1984).

### PALEONTOLOGY

"Highly significant fossils are found in many places throughout the Vernal District. Some world-known localities, as well as some North American mammal-age type localities are found in the Vernal District" (Robinson 1978).

Numerous paleontological finds and sites have been discovered by archaeologists and/or paleontologists while performing work on lands administered by the BLM. These finds are usually connected to clearances for energy development and BLM range projects.

There are at least 20 geologic formations present in the BCRA. They range in time from the quarternary pleistocene to Pennsylvannian period formations. A large variety of environments provided habitats for diverse populations of aquatic/terrestrial plants and animals. Two formations, the Uinta and Green River, comprise two-thirds of the area of the planning units. Quaternary period deposits dominate the river-tributary systems while the remaining 17 are folded into the mountainous northeastern portion of the planning unit.

The known fossil assemblage in the Uinta Basin has enabled paleontologists to construct a reasonably accurate history ... covering a several million-year span including evolutionary changes, climatic regimes, and appearance and extinction of life forms. For example, the earliest record of camels and ducks comes from the Uinta Basin. The Cenozoic era (the last 65 million years) has been divided into the shortest recognizable time intervals on the basis of fossil mammals. Two of these time intervals for North America, the Uintan and Duchesnean, are based on fossil mammals from the Uinta Basin.

The Duchesne River formation lies below the surface alluvium. Fossils are rare and not commonly encountered in this formation. However, when encountered, they are likely to be highly important because of their rarity (BLM 1982).

A variety of reports on this area have been completed. A complete list may be obtained by request from the Vernal District.

### SOCIOECONOMICS

The format for this section includes an overview of the affected area, followed by a more detailed discussion of the significant economic considerations that pertain to the planning issues. The methodologies and computations that were used for the affected environment are discussed in Appendix 12 (Methodology for the Economic and Social Analysis).

### Economic Conditions

This section focuses on Uintah and Duchesne counties in Utah and the communities of Dinosaur and Rangely in Colorado.

Statistics show that mining (mineral development) is the most important private industry in Uintah county. Growth in this industry was primarily responsible for the county's 62 percent population increase between 1970 and 1980. Mining directly accounts for nearly 23 percent of the employment and 36 percent of the income in the county (see Table 3-5, Personal Income and Employment—Uintah and Duchesne Counties, 1981). Other sectors, which contribute to employment and support of the local economy include; the Federal government which accounts for five percent; manufacturing, which accounts for two percent; agriculture, which accounts for six percent, tourism, accounts for all undefined parts of the total county employment.

The 1980 Uintah County population was 20,506 (Tables 3-6, Summary of Regional Infrastructure Conditions and 3-7, Baseline and Interrelated Population Growth). About 31 percent of the county's population live in Vernal (1980 population of 6,600), which serves as the regions retail and service center.

Duchesne County has a similar economic base to that of Uintah County, however, it is more dependent on mining (Table 3-5). Growth in the petroleum industry was primarily responsible for the county's 72 percent population increase between 1970 and 1980. Thirty percent of the employment and nearly 44 percent of the income is directly attributable to mining. Duchesne County also has a small manufacturing sector (four percent of employment) and Federal government sector (seven percent of employment). Another sector which generates local employment is agriculture (12 percent of local employment). Tourism accounts for all of the undefined parts of county employment.

The 1980 Duchesne County population was 12,565. Duchesne (1980 population of 1,677), Myton (1980 population of 500), and Roosevelt (1980 population of 3,842) are the largest communities in the county (USDC 1981).

The town of Rangely, Colorado, (1980 population of 2,615) is located 20 road miles east of the resource area (USDC 1981). The community's economic base is primarily energy related. Growth of this base industry has resulted in a 33 percent population growth between 1970 and 1980.

The town of Dinosaur (1980 population of 410) is located 3 miles east of the BCRA (USDC 1981). The community's economic base is primarily agricultural and energy-related. Because of it's location directly south of Dinosaur National Monument and on U.S. Highway 40, tourism also plays a part in it's economy.

Summary data on the region's existing infrastructure conditions are contained in Table 3-6. Generally, the area is upgrading its infrastructure to meet the needs of existing and projected baseline populations.



# CHAP. 3 - AFFECTED ENVIRONMENT

TABLE 3-5

Personal Income and Employment  
 Uintah and Duchesne Counties 1981  
 (By Place of Work)

	UINTAH COUNTY		DUCHEсне COUNTY	
	Earnings (Percent)	Employment (Percent)	Earnings (Percent)	Employment (Percent)
Agriculture	2	2	3	3
TOTAL AGRICULTURAL	2	2	3	3
Mining (Mineral Developments)	36	23	44	30
Construction	4	4	5	4
Manufacturing	1	2	5	4
Transportation and Public Utilities	10	7	7	5
Wholesale Trade	5	4	6	6
Retail Trade	8	13	7	14
Finance, Insurance, and Real Estate	2	2	2	2
Services	23	27	7	7
Other	—	—	—	—
Total Private Industry	89	83	82	72
Federal Government	3	5	4	7
State and Local Government	6	11	10	18
Total Government	9	16	14	25
TOTAL NONAGRICULTURAL	98	98	97	97
Unemployment (Fourth Quarter, 1983)		7.8		8.0
	(Dollars)	(Jobs)	(Dollars)	(Jobs)
Total Employment and Earnings	\$148,435,000	10,238	\$ 88,355,000	6,069
Total Personal Income (By Place of Residence)	\$195,717,000		\$106,001,000	
Per Capita Personal Income	\$ 9,058		\$ 8,520	

Note: Because of rounding, numbers are not additive.  
 Total and percentage income figures include wage, salary, and proprietors' income. Total employment figures include wage, salary, and proprietors' employment, whereas the employment percentage figures include only wage and salary employment. The relative importance of farm employment is, therefore, underrated.

Sources: USDC 1983; UDES, 1984.



TABLE 3-6

## Summary of Regional Infrastructure Conditions

Socioeconomic Development Category	Duchesne County	Uintah County	Community of Rangely	Community of Dinosaur
Population (1980)	12,565	20,506	2,615	410
Infrastructure				
Housing				
Single family	2,622	4,893	492	83
Multi-family	142	253	85	0
Mobile homes	1,116	1,261	240	325
Hotel	249	574	100	33
Education				
Students	4,247	6,478	511	108
Present capacity	4,886	6,143	980	175
Teachers	185	223	N/A	N/A
Health Care				
Hospital beds				
General & long term	32	36	28	9
Medical personnel				
Doctors	N/A	11	3	9
Dentists	N/A	10	1	9
Nurses	N/A	N/A	10	9
Medical health care Personnel	5	N/A	N/A	9
Public Safety				
Law Enforcement				
Police officers	22	39	2	1
Patrol cars	8	21	5	2
Jail space (units)	36	27	N/A	N/A
Juvenile holding cells	0	N/A	N/A	N/A
Emergency Medical Services				
Ambulances	N/A	2	2	9
Emergency medical technicians	51	35	11	9
Utility Service Demands				
Water System				
Connections	1,789	6,215	714	N/A
Supply (10 <sup>6</sup> gallons/year)	2,263	3,723	658	N/A
Storage (10 <sup>6</sup> gallons/year)	1,789	1,205	365	.4
Sewage System				
(10 <sup>6</sup> gallons/year)	803	986	732	N/A
Solid Waste <sup>a</sup>				
Percent unused	70	90	72	N/A

Source: Utah 1983; Argonne 1983

N/A: Not Available

Dinosaur's health care needs are catered by Rangely.

<sup>a</sup>The State of Utah community facility guidelines do not include a solid waste standard. Therefore, an estimate of solid waste disposal conditions could not be made.



### CHAP. 3 - AFFECTED ENVIRONMENT

Table 3-7  
Baseline and Interrelated Population Growth

	1980	1985		1990		1995		2000	
		Base	Other	Base	Other	Base	Other	Base	Other
Duchesne	12,565	17,778	4,965	18,632	9,542	18,684	12,333	18,292	14,910
Roosevelt CCD	9,714	13,695	4,897	15,057	9,404	15,005	12,190	14,636	14,701
Roosevelt	3,842	5,416	3,428	5,995	6,582	5,934	8,533	5,789	10,291
Myton	500	705	171	775	329	773	427	754	515
Unincorp. Area	5,372	7,574	1,298	8,287	2,493	8,298	3,230	8,093	3,895
Duchesne & Sq. & No.									
Duchesne CCD <sup>2</sup>	2,851	4,083	68	3,575	138	3,679	143	3,656	209
Uintah	20,506	25,730	18,940	29,326	34,690	29,863	44,174	28,985	52,445
Uintah-Ouray									
CCD	4,338	5,061	445	5,699	830	5,730	926	5,565	1,027
Ballard	558	775	223	966	416	976	464	926	514
Unincorp. Area	3,780	4,286	222	4,733	414	4,754	462	4,639	513
Vernal CCD	16,168	20,653	13,858	23,611	32,011	24,117	43,041	23,404	51,209
Vernal	6,600	9,291	6,165	11,065	13,918	11,369	18,786	10,941	22,328
Unincorp. Area	9,568	11,362	12,330	12,546	19,942	12,748	24,462	12,463	29,090
Bonanza <sup>1</sup>		16	4,637	16	1,849	16	207	16	209
Moffat-Rio Blanco		24,255	1,176	28,345	3,004	27,646	3,837	28,144	4,518
Dinosaur	410	501	517	405	1,367	425	1,744	437	2,055
Rangely	2,614	3,193	659	3,993	1,637	3,805	2,093	3,962	2,463
Grand	8,241	9,850	691	10,570	834	10,324	915	9,676	919
Thompson CCD	326	380	691	366	834	366	915	365	919
Moab CCD	7,915	9,470	-	10,204	-	9,958	-	9,311	-
Daggett Co., Utah & Mesa Co., Colo.			1,510		1,198		1,731		2,185

Note: Daggett County, Utah and Mesa County, Colorado are not within the affected area as the term is used in the text.

<sup>1</sup>Bonanza does not correspond with any official census area, but is roughly the area delineated by the BCRA.

<sup>2</sup>CCD = County Census Division



## CHAP. 3 - AFFECTED ENVIRONMENT

A housing shortage in Uintah County was indicated by low vacancy rates and higher than average housing prices in 1980 and 1981. By 1983, this housing shortage was alleviated through continued housing construction and a slump in the oil and gas industry. Housing shortages have also been serious in the town of Rangely because public land surrounding the city has limited expansion and has resulted in inflated land prices which, in turn, has discouraged new housing construction.

Many of the schools in Uintah County have been operating over capacity. Three schools have been operating at 150 percent over capacity, and one school at 256 percent over capacity. To help alleviate the problem, two new elementary schools were opened in 1983. A new high school is under construction in Vernal and will be completed in 1986.

Both Duchesne and Uintah Counties have existing shortages of medical personnel, particularly for mental health care. They also have deficient jail space. Uintah's jail does not comply with Federal and State standards; however, a new expansion project should be completed during 1984.

Vernal and the surrounding area's water system is operating at 50 percent over capacity. Two new water systems are presently being developed. The sewer system is also operating over capacity; however, a new system with a 40,000 person capacity is now being installed. The town of Dinosaur has begun construction on a central sewer system designed for a 2,000 person capacity.

In general, the counties and communities in the area have been able to handle the added expenditures necessitated by growth in the 1970s and have adequate debt available to handle additional fiscal burdens (Table 3-8, Summary of Fiscal Conditions for Affected Counties and Communities).

Fifteen percent of Uintah County and eighteen percent of Duchesne County is Uintah and Ouray Indian Reservation land (USDA 1983). The reservation has a checkerboard land ownership distribution over which the tribal committee has jurisdiction as a politically distinct unit. Approximately 4,100 American Indians reside in Duchesne and Uintah county (USDA 1983). Only an estimated 50 percent of the tribe's potential work force is employed (Utah 1983). Few Indians are employed in energy-related developments. Lack of employment opportunities has led to outmigration.

There is an existing housing shortage on the reservation and many existing housing units are in deficient condition. The tribe's water system distributes water to a number of non-Indian communities including Ft. Duchesne, Myton, and Ballard. Demands on the system already exceed its present capacity.

The reservation also has its own police force and health care facilities.

The Ute Tribe's largest sources of revenue are bonus, lease, and oil and gas royalty monies. Grants and contracts are the second largest source of revenues. Because the tribe cannot levy property taxes, energy developments

which take place outside the reservation increase infrastructure-related costs and do not increase tribal revenues.

A number of other businesses depend on the mining industries to purchase their services and products, and many retail and service businesses depend on the workers to spend locally. The mining sector is comprised of oil and gas exploration, production, and field services, phosphate mining, gilsonite mining, oil shale development, and sand and gravel extraction. Employment by activity is identified in Table 3-9 (Uintah County's 1982 Mining Employment Breakdown).

Employment in the oil and gas sector is highly variable. Since 1980, the area has experienced both a minor "boom" and a minor "bust" in exploration work. The Vernal area has been somewhat cushioned from these "boom/bust" cycles because it has become the center for oil and gas field service companies which are a more stable source of employment.

Two companies are active in the shale oil business and there is one small tar sand operation in the area which employs less than 10 people.

Local units of government receive property tax revenues from mining equipment, mining facilities, and sales and property tax revenues from employees directly employed in the mining industry. Only Uintah County receives property tax revenues from mining equipment and facilities which are located within the BCRA.

Of the 39 livestock operations using BCRA forage, 21 are cattle operations and 18 are sheep operations. Fifty-three percent of these operators live in Uintah County, 5 percent in Duchesne County, and another 38 percent live in western Colorado.

Livestock operators have been grouped by herd size Table 3-10 (Livestock Operations by Herd Size). Based on the average budgets of the varying operators, most operators should be able to cover their long-term costs. However, many ranching operations differ in degree of indebtedness, operating cost, and size of operations, suggesting that some operators may not be able to meet long-term or cash costs. The returns to smaller operators have generally been too small to be the sole source of their income; few operators have earned a fair market return for their investments and land through their farm income. However, escalating farm real estate values between 1970 and 1981 have been contributing to fair market returns (Hughes 1983; Duncan 1983). Aggregate ranch budget statistics are summarized in Table 3-11 (Aggregate Costs and Returns for Operators Who Use Book Cliffs Resource Area Forage).

Grazing fees represent a minimum value for public forage; however, the grazing fee is not determined through the market and is generally accepted as lower than its true economic value (USDA, USDI 1977). Although the forage quality, season of use, and added services make comparisons between BLM forage and privately leased forage questionable, private lease rates still provide one of the best measures of value. Utah's private lease rate averaged \$7.24



### CHAP. 3 - AFFECTED ENVIRONMENT

TABLE 3-8  
Summary of Fiscal Conditions for  
Affected Counties and Communities

	Average Annual Revenues (Thousands)	Average Annual Expenditures (Thousands)
Duchesne County	4,874	4,209
Duchesne	423	343
Roosevelt	2,355	2,175
Uintah County	17,787	14,905
Ballard	68	68
Naples	653	652
Vernal	4,604	4,660
Dinosaur	143	80
Rangely	1,293	1,351

Source: State 1983

TABLE 3-9  
Uintah County's 1982 Mining Employment Breakdown  
(By Place of Employment)

	Average Employment	Percent
Oil and Gas Production and Field Services	1,460	71
Oil Shale	160	8
Tar Sands	0-10	a
Gilsonite	160	8
Sand and Gravel	20-49	1-2
Metal Mining	0-10	a
Miscellaneous	203-252	10-12
Total	2,052	100

Source: USES 1983; Haslem 1983; Carlburt 1983; Godlove 1983; Geokinetics 1983.

a: Less than 1 percent



## CHAP. 3 - AFFECTED ENVIRONMENT

TABLE 3-10

### Livestock Operations By Herd Size

<u>Livestock Operators</u>	<u>1-99 Cows</u>	<u>100+ Cows</u>	<u>100+ Cows Yearlong</u>	<u>Sheep All</u>
Number of Operators	10	1	10	18
Average Herd Size	52	201	847	2,780
Aggregate Herd	520	201	8,470	50,040

TABLE 3-11

### Aggregate Costs and Returns for Operators Who Use Book Cliffs Resource Area Forage

	<u>Cattle</u>	<u>Sheep</u>	<u>Total</u>
Gross Revenues	\$2,415,282	\$3,585,258	\$6,000,540
Cash Cost	1,441,458	1,509,804	2,951,262
Returns Above Cash Cost	973,824	2,075,454	3,049,278
Returns to Family Labor and Investment	526,204	1,719,522	2,245,726

Source: Gee, 1981.



## CHAP. 3 - AFFECTED ENVIRONMENT

per AUM in 1982 (USDA 1983). There are a number of other indications that the value of public forage in the BCRA is close to the \$7.24 per AUM figure (Gee 1981; USFS 1980). Using the \$7.24 figure, the estimated annual value of livestock forage provided by the BCRA is \$484,935.

Although BLM does not recognize a capitalized value for grazing preferences, the market does recognize a capitalized value whenever grazing fees are lower than their true economic value (Gardner 1962). If a permit's value averages \$60 per AUM, and the entire permit value is capitalized in the ranch's value, then grazing privileges in the BCRA account for \$6,174,900 or 20 percent of the aggregate ranch value of operators using BCRA forage. Since grazing privileges can affect both base property values and rancher income, changes in grazing privileges could also affect ranchers ability to obtain loans.

Recreation activities within the BCRA include hunting, fishing, river floating, dispersed ORV use, camping, sight-seeing, and Christmas tree cutting. In 1982, there were 7,200 recreation days spent in the resource area (excluding hunting days), which generated \$324,000 in expenditures. Hunters contribute to the local economy through their hunting-related expenditures. In 1982, big game hunting amounted to approximately 6,770 hunter days and accounted for \$304,650 in expenditures.

### Social Conditions

The area was largely settled by "Mormon" colonizers, most of whom had small land holdings. They formed small, mostly rural, villages which, because of their common religious beliefs, were close-knit communities.

A dominant emphasis in these communities included personal independence, local government and belief in progress and the development of natural resources (Centaur 1979). Although not as dominant today, many of these cultural values still hold true.

Energy-related development has brought significant growth to the Uintah Basin. As a result, traditional farming and ranching communities have lost some of their cultural identity (Utah 1983). Political, social, and economic diversity have increased. Energy-related developments have created jobs, brought new people to the area, and have

created a diverse retail and service sector. Growth has forced the area to establish outside linkages with State and Federal agencies and has shown the regional ability to coordinate its efforts in response to impending problems.

Many residents feel that the improvements in living conditions outweigh the problems associated with rapid growth. Residents are aware, although skeptical, of potential oil shale and tar sand developments. Attitudes towards mineral developments are even more cautious among local Ute Indian Tribal members.

Most tribal members are aware of possible energy developments and are concerned over possible cultural and environmental impacts. Preserving the primitive character of the Hill Creek Extension is a particular environmental concern of most tribal members (Duncan 1983b).

Social conditions of the local American Indian population differ from the local non-Indians. The Uintah and Ouray Indian Reservation is governed by an elected business committee which has sovereign power over tribal lands. The income and living condition disparity between Indian and non-Indians has not improved with energy developments.

Cooperation and rapport between livestock operators and BLM appears to be good. Wildlife-livestock conflicts are recognized in the Blue Mountain area and mineral-livestock conflicts are recognized throughout the BCRA. In both cases, there is the belief that many of these conflicts can be resolved through range improvements.

### TRANSPORTATION

Four major roads carry the majority of traffic through the BCRA. These are U.S. 40, Utah 88, Utah 45, and County Road 262 (Figure 1-1). Dirt roads provide access to much of the Resource Area.

If traffic volumes increase, the level of service on U.S. 40 and between Utah 88 and Vernal, and Vernal and Jensen, would be unsatisfactory Table 3-12 (Projected 1985 Base-line Average Daily Traffic Levels). All other road segments would remain at a satisfactory level (UBS 1983). If the segment of U.S. 40 between Vernal and Jensen is upgraded in 1984 as planned, then it's condition would improve to a satisfactory level.



## CHAP. 3 - AFFECTED ENVIRONMENT

Table 3-12  
Projected 1985 Baseline Average Daily Traffic Levels

Highway Segment	Baseline
<u>Utah 88</u>	
From Ouray to U.S. 40	391
<u>U.S. 40</u>	
From Utah 88 to Vernal	3,955
From Vernal to Jensen	5,356
From Jensen to County 262	2,348
From County 262 to Colo. Line	1,975
<u>County 262</u>	
From Utah 45 to U.S. 40	323
<u>Utah 45</u>	
From Vernal to County 262	N/A

Source: Uintah Basin Synfuels Development Final EIS

NA = Not Available

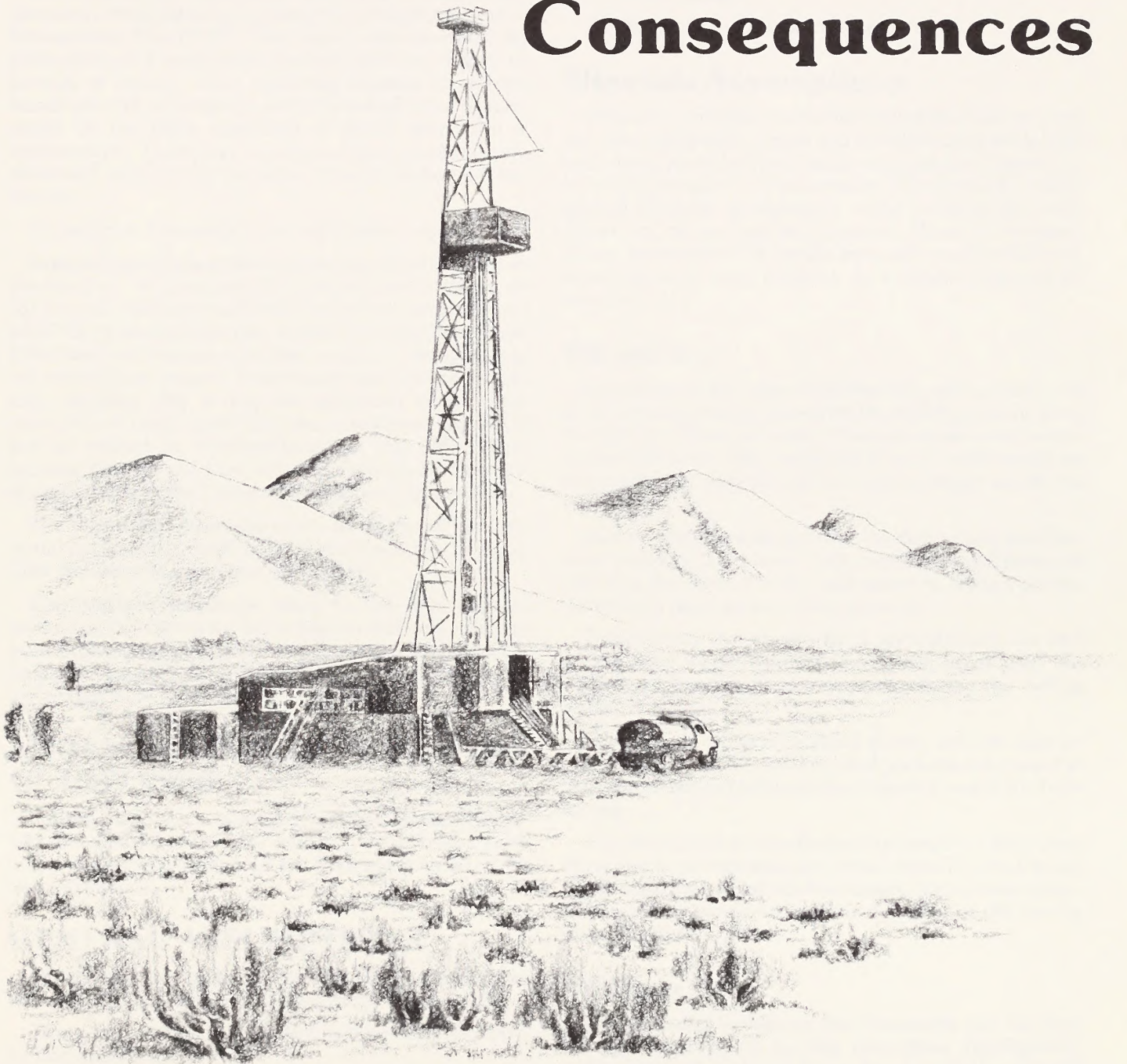






# Chapter 4

## Environmental Consequences









# CHAPTER 4

## ENVIRONMENTAL CONSEQUENCES

### INTRODUCTION

This chapter discusses the environmental consequences (impacts) of implementing the alternatives to form a Resource Management Plan (RMP). The impacts are discussed, by alternative, at a level commensurate with the degree or severity of impact. Laws regulating impacts to cultural resources and endangered and threatened plant species would be the same regardless of which alternative is implemented. Therefore, impacts to these resources are discussed only in the General Impacts section of this chapter.

Three terms frequently occur within this chapter:

**Interrelated impacts** refers to impacts which exist as the result of: (A) previous BLM project commitments, or (B) impacts resulting from State and private projects over which BLM has no authority. Implementation of the Book Cliffs Resource Management Plan would not change any of the interrelated impacts. Interrelated impacts are specifically identified only if they are significant or have the possibility of being significant when combined with BLM actions related to implementation of the RMP. Also, because they do not vary between alternatives, they are discussed only in the Current Management Alternative.

The term **BLM impacts** refers to any impacts which would occur as the result of BLM implementing the Book Cliffs Resource Management Plan (RMP).

**Cumulative impacts** refers to the total impacts created by combining the BLM impacts (impacts resulting from implementing the RMP) and the interrelated impacts (impacts resulting from State, private, and previously committed BLM projects).

### ANALYSIS ASSUMPTIONS AND GUIDELINES

For the purpose of analyzing the impacts of implementation of each alternative, the following assumptions were made. Note that assumptions were not made for all of the identified issues.

### GENERAL ASSUMPTIONS

To facilitate preparation of this draft EIS, landownership was assumed to remain unchanged from August 1, 1983.

The management actions and mitigating measures would be implemented.

All actions would conform with existing laws, including protection of cultural resources and endangered and threatened species.

Management actions would only involve public lands except where exchange-of-use agreements exist with non-Federal land owners.

The White River Dam will be built.

### Minerals Assumptions

Generally, multiple mineral developments could occur in the same geographical area and could be compatible with each other, provided the initial development is mitigated for by any subsequent developments. For example, underground oil shale development could occur in the same vicinity as oil and gas development. However, in some cases, development of certain minerals could be delayed, some recovery rates reduced, or a mineral may not be developed at all.

### Oil and Gas

Regardless of the alternative selected, approximately 40 to 80 wells would be drilled within the BCRA annually; 28 to 56 wells would be producible and would remain in existence at least 10 years. The remaining 12 to 24 wells would be nonproducing and the surface disturbance would be reclaimed.

Surface disturbances required for drilling and development would include access roads, powerlines, drill pads and well sites, flow lines, storage tank batteries, storage ponds, distribution pipelines and other projects.

Total surface disturbance for a particular well site and access road would average four to six acres with the majority of the disturbance occurring during the drilling phase.

Oil wells are generally spaced at one well per quarter section (four wells per section), and gas wells are spaced at one well per section, although spacings may vary from these figures.

The effects of oil and gas production would not differ from those that have been analyzed in the Vernal District Oil and Gas Leasing Environmental Assessment. Appropriate mitigating measures would be continued as part of the leasing program (BLM 1976).

### Oil Shale

The estimated barrels per day operations and resulting acreage disturbances for the conceptual development within future oil shale tracts are shown in Tables 4-1 (Oil Shale Magnitude of Conceptual Development in Barrels Per Day), 4-2 (Underground Oil Shale Mining-Magnitude of Conceptual Development in Acreage Disturbance), and 4-3



TABLE 4-1  
Oil Shale Magnitude of Conceptual  
Development in Barrels Per Day

COMMODITY PRODUCTION ALTERNATIVE											
Probable Mining Method	Total Area Available For Lease (Acres)	Mahogany Zone	Rich Zone	No.	Potential Future Lease Tracts	Recoverable Barrels Within Tracts (Rich Zone Only)		Length of Mining Operation (Years)	Barrels Per Day	Barrels Per Day (Rounded)	
						Total (Millions)	Recovery (PCT)				
											Recovery of (Millions of Barrels)
(Thousands)											
Underground	84,000	12,000	8,000	3-4**	15,450-20,600	1,500-2,000	65	980-1,300	20	131-178	130-180
In Situ	14,000	1,500	780	0-1**	0-5,150	300	50	150	20	20.5	20
BALANCED USE ALTERNATIVE											
Underground	42,000	6,400	3,700	2-4**	10,300-20,600	900-1,800	65	600-1,200	20	82-164	80-160
In Situ	6,000	650	310	0-1**	0-5,150	270	50	135	20	18.5	20
RESOURCE PROTECTION ALTERNATIVE											
Underground Only	18,000	2,500	1,500	2	10,300	860	65	560	20	76.7	80

\*Kerogen

\*\*No more than 4 total tracts would be leased regardless of the mining method employed.



TABLE 4-2  
Underground Oil Shale Mining-Magnitude of Conceptual  
Development in Acreage Disturbance

Total Area Available for Lease		Total Area With Potential For Tract Delineation				Acreage Disturbance			Average Total Disturbance***		
		Spent Shale Disposal		'Permanent' (Includes Plant and Mine Facilities, Storage Facilities, Retention Dams, etc.)		Other (Includes Rights-of-Way and Construction Camps)					
		Annual Acres Disturbed* (1%)	Annual Acres Reclaimed** (.5%)	Acres Disturbed (One Time) (4%)	Acres Reclaimed (One Time) (1%)	Acres Disturbed (One Time) (5%)	Acres Reclaimed (One Time) (4%)				
COMMODITY PRODUCTION ALTERNATIVE											
84,000	15,450-20,600 (3-4 tracts)	150-200	75-100	600-800	150-200	750-1,000	600-800	1,200-1,600	500-600		
BALANCED USE ALTERNATIVE											
42,000	10,300-20,600 (2-4 tracts)	100-200	50-100	400-800	100-200	500-1,000	400-800	800-1,600	300-600		
RESOURCE PROTECTION ALTERNATIVE											
18,000	10,300 (0-2 tracts)	100	50	400	100	500	400	800	300		

\*A 2% initial disturbance would occur.

\*A 2% initial disturbance would occur. Three additional years would be required for adequate forage development. Disposal areas would be disturbed more rapidly than rehabilitation would occur for several years.

development. Disposal areas would be discussed more fully than coal shale reclaimed areas would not be available for forage consumption through the life of the project.

\*\*\*Through a 10-year period at a given time.



TABLE 4-3  
In Situ Oil Shale Development-Magnitude of Development  
in Acreage Disturbance During Full Production\*

Total Available Acres	Total Potential Tract Acres	Project Life	'Permanent' Disturbances** (5%)	New Annual Disturbance (5%)	Area Undergoing Rehabilitation*** (15%)	Total Of All Disturbances (25%)
COMMODITY PRODUCTION ALTERNATIVE						
14,000	0-5,150	20 years	0-250	0-250	0-750	0-1,250
BALANCED USE ALTERNATIVE						
6,000	0-5,150	20 years	0-250	0-250	0-750	0-1,250

\*In situ oil shale development is not considered likely in the areas that could be leased under the Resource Protection Alternative.

\*\*Includes plant site, storage facilities, etc.

\*\*\*Reseeded and fenced.



## CHAP. 4 - ENVIRONMENTAL CONSEQUENCES

(In Situ Oil Shale Development-Magnitude of Development in Acreage Disturbance During Full Production). These assumptions are based on the best available data (Cashion 1967, Smith 1981, Trudell et al. 1983, BLM 1982b, BLM 1983a, Bechtel Petroleum, Inc. 1981).

Although room-and-pillar mining methods are anticipated, modified in situ methods could also be used. Shallow oil shale deposits would be developed by true in situ methods and would be similar in appearance and impacts to the ongoing Geokinetics oil shale project. A detailed description of the project is being prepared and should be available through the Division of Oil, Gas, and Mining, State of Utah.

Based upon current legislation, no off-site disposal of spent oil shale would be authorized.

### Tar Sand

Combined Hydrocarbon Lease Applications received prior to November 16, 1983 will be analyzed in separate environmental documents. Tracts leased competitively will also be analyzed in separate environmental documents.

The estimated barrels per day operations and estimated acreage disturbances for conceptual tar sand development in the PR Spring STSA are presented in Tables 4-4 (Tar Sands-Magnitude of Conceptual Development in Barrels Per Day, for the PR Spring STSA) and 4-5 (Tar Sands-Magnitude of Conceptual Development in Acreage Disturbance for the PR Spring STSA). These estimates differ slightly from the Utah Combined Hydrocarbon Regional Draft EIS, because of improved data. The following comments relate to those tables:

- All assumed tar sand developments were within the central and southern portion of the PR Spring STSA. The levels of development in PR Spring STSA are within the scope of development predicted in the Utah Combined Hydrocarbon EIS (BLM 1983f).
- Based upon a more recent, detailed evaluation of data, most tar sand deposits would likely be developed by an in situ, thermal combustion process because the depth of overburden is too great for economical surface mining (Hubbard 1983). The area suitable for surface mining of tar sand (strip ratio of 1:1 or less) is much smaller than was previously estimated in the Utah Combined Hydrocarbon Regional EIS (BLM 1983f). A thermal combustion process was assumed instead of a steam process for two reasons. The relatively thin overburden (less than 350 feet) is considered insufficient for a steam process, and the amount of water necessary for the steam process may not be readily available (BLM 1983f, Kruuskraa 1978).
- Within the limited areas where surface mining could be employed, development was assumed to be similar to a coal strip mine. Generally, after a unit area would be mined, it would be backfilled with the material from a subsequent mine unit. For example,

a mined out unit would be backfilled with spent sand, overburden, and covered with topsoil from the adjacent unit. This is a refinement of the prediction made within the Utah Combined Hydrocarbon Leasing EIS that surface mining would be open pit with little or no backfilling into the mine area.

- Development of the Hill Creek and Raven Ridge-Rim Rock STSAs was assumed to be consistent with the high level scenario of the Utah Combined Hydrocarbon Leasing EIS which predicted limited development.

### Gilsonite

Approximately one to five miles of currently unleased gilsonite veins would be leased and subsequently developed in the next 10 years. Mine staging areas, which include a head frame, haul house, access roads and storage areas would be laid out in intervals of 600 to 1,200 feet along a vein. Each staging area, including access roads, would disturb approximately three acres. Each staging area would remain in existence up to ten years.

### Sand and Gravel

Sand and gravel pits are usually granted in 40-acre parcels. Within these parcels, one to five acres may be used for equipment, set up, and stock piles, and one to two acres may be used for topsoil storage. The rest of the area could be available for mining. The length of activity could vary, but generally, the life of the pit would be one to two years with another one to two years required for reclamation. In some locations, small quantities of water may be required.

Conceptual disturbance from potential sand and gravel developments is shown in Table 4-6 (Sand and Gravel-Magnitude of Development in Acreage Disturbance).

### Right-of-Way Corridors Assumptions

Common oil and gas pipelines, roads related to oil and gas development, and roads related to large overhead powerlines, generally disturb a 30-foot wide area, although up to 100 feet could be disturbed by larger projects. This would result in 3 to 12 acres of disturbance per linear mile. In some instances, maintenance roads to powerlines could negate total reclamation.

### Forage Assumptions

1. Analysis of forage-related impacts is based on expectations of near normal annual climate conditions. Severe climate variations could drastically alter vegetation responses.
2. The proposed vegetation manipulations would be implemented over a 10-year period.
3. The difference between initial and projected livestock use levels would be based on site potentials,



TABLE 4-4  
Tar Sand-Magnitude of Conceptual  
Development in Barrels Per Day  
for the PR Spring STSA

Assumed Develop- ment (Acres)	Total Recoverable Barrels* (Millions)	Probable Mining Method	Total Area With Poten- tial for Development	Total Recover- able Barrels By Mining Type (Millions)	Amount of Resource Recovered		Length of Mining Operations	Barrels Per Day Operations	Barrels Per Day Operations, All Developments	Barrels Per Day Rounded to Nearest 5,000
					Amount of Resource Recovered (PCT)	Amount of Recovered (Millions of Barrels)				
COMMODITY PRODUCTION ALTERNATIVE										
89,000	700	In Situ	44,500- 62,300	385- 540	30- 50	115- 270	20 years	15,750- 37,000	25,050- 58,250	25,000- 60,000
		Surface	8,900- 17,800	75- 155	90- 100	68- 155	20 years	9,300- 21,250		
BALANCED USE ALTERNATIVE										
23,500	300	In Situ	11,750- 16,450	165- 230	30- 50	50- 115	20 years	6,850- 15,750	12,700- 25,750	15,000- 25,000
		Surface	2,350- 4,700	35- 65	90- 100	32- 65	15 years	5,850- 10,000		
RESOURCE PROTECTION ALTERNATIVE										
4,200	55	In Situ	2,100- 2,940	30- 42	30- 50	9- 21	10 years	2,450- 5,750	5,200- 12,350	5,000- 10,000
		Surface	420- 840	6- 12	90- 100	5- 12	5 years	2,750- 6,600		

\*All development was assumed to occur in the central and southern part of PR Spring STSA.



TABLE 4-5  
Tar Sand-Magnitude of Conceptual  
Development in Acreage Disturbance  
for the PR Spring STSA\*

Assumed Develop- ment (Acres)	Probable Mining Method	Assumed Development By Mining Type (PCT)	Assumed Development By Mining Type (Acres)	Permanent Facilities (Plant Site Storage Assumed Facilities, etc.) (PCT)	Annual Mining Disturbance (PCT)	Area Under- going Rehabili- tation (Re- seeded and Fenced) (PCT)	Additional Area in Disturbance (Waste and Tailings Piles) (PCT)	Total of All Disturb- ances (PCT)	Total of All Disturb- ances (Acres)	Total of All Disturb- ances (All Mining Methods) Rounded to Nearest 100 Acres
COMMODITY PRODUCTION ALTERNATIVE										
89,000	In Situ	50-70	44,500- 62,300	5	5	15	0	25	11,125- 15,575	13,400- 22,700
	Surface	10-20	8,900- 17,800	5	5	15	0-15	25-40	2,225- 7,120	
BALANCED USE ALTERNATIVE										
23,500	In Situ	50-70	11,750- 16,450	5	5	15	0	25	2,950- 4,110	3,800- 6,600
	Surface	10-20	2,350- 4,700	5	7	20	0-20	32-52	750- 2,450	
RESOURCE PROTECTION ALTERNATIVE										
4,200	In Situ	50-70	2,100- 2,950	5	10	30	0	45	950- 1,330	1,400- 2,200
	Surface	10-20	420- 840	5	20	60	15	100	420- 840	

\*All developments were assumed to occur in the central and southern portions of the PR Spring STSA.



TABLE 4-6  
Sand and Gravel-Magnitude of  
Conceptual Development in Acreage Disturbance

Total Area (Acres)	Anticipated Demand (acres) (Annual)	Rehabilitated Area (Percent) (10 Years)	Total Disturbance (Acres) (10 Years)	Total Disturbance* (Acres) (10 Years)
CURRENT MANAGEMENT ALTERNATIVE				
8,500	Unquantifiable	Unknown	Unknown	Unknown
RESOURCE PROTECTION ALTERNATIVE				
0	10-15	100-150	N/A**	N/A*
COMMODITY PRODUCTION ALTERNATIVE				
12,500	50-110	500-1,100	500-1,100	250-550
BALANCED USE ALTERNATIVE				
8,500	20-50	200-500	50	100-250

\*Includes rehabilitation.

\*\*Not applicable as no development would occur under this alternative.



## CHAP. 4 - ENVIRONMENTAL CONSEQUENCES

the level of interacting use demands, and the level and direction of management.

4. Livestock operators will have up to five years to adjust ranching operations to coincide with any final adjusted livestock utilization levels.
5. Range data are sufficient to indicate current ecological condition and trend.
6. Noncompetitive use for forage between livestock and wildlife was not taken into consideration in the original allocation process. This would amount to an unknown quantity of additional forage that would be available for wildlife and livestock.
7. Forage which would be available for wildlife, on State and private lands, has not been included in allocating forage for wildlife.
8. The forage inventories and forage adjudications (AUMs) completed in the early 1960's are accurate with respect to total forage production and total utilization levels by livestock and wildlife. However, due to the kind and intensity of inventory conducted and the limited number of elk and wild horses at the time of adjudication, the following criteria were not fully considered (Oldroyd 1984):
  - a. Noncompetitive livestock/wildlife forage utilization,
  - b. Suitability, including distance from water,
  - c. Forage adjudication for wild horses,
  - d. Forage adjudication for elk.

Mitigation for forage actions are incorporated within the alternatives. See forage section in Chapter 2 and Appendix 8, Mitigating Measures for Land Treatments.

### Wildlife and Wild Horse Assumptions

There will be an unquantifiable loss in crucial big game range on State and private land. The loss would increase the big game forage demand on other State and Federal land.

### Threatened and Endangered Plant Assumptions

In any of the locations identified as having potential habitat for threatened and endangered plant species, clearance of the area will be required, as prescribed by law, and prior to initiating any surface disturbing activity, such as range improvement work, minerals development, watershed protection, etc.

### Woodland Assumptions

Productive timberland (Douglas fir) would be harvested on a 150-year rotation, woodland on a 150-year rotation for medium production sites, and a 125-year rotation for high

production sites (pinyon-juniper), and cottonwood on a 65-year rotation. No live aspen, ponderosa pine, or Gambels oak would be harvested.

In calculating the allowable cut, the woodland resource for the Winter Ridge WSA is not included in the Current Management Alternative. The interim management policy does not permit commercial harvest of woodland products. However, for the other three alternatives, the forest resource is included in the allowable cut and would become available for harvest, if the area is determined to be unsuitable for wilderness.

### Recreation Assumptions

Flows of less than 250 cfs in the White River would be insufficient for floatboating.

### Visual Resources Assumptions

Many projects would have short-term visual impacts (three to five years) that may exceed the management objectives for a particular VRM class. However, these impacts would not be considered significant providing the projects conform to management objectives in the long term (10 to 20 years) following implementation.

### Water Use Assumptions

1. Water use under Current Management includes 28,000 acre-feet for White River Shale Oil Corporation (tracts U-a and U-b), 77,000 acre-feet for the high-level scenario projected in the Uintah Basin Synfuels Development EIS, and an estimated 62,000 acre-feet for the unresolved Ute Tribe entitlements.
2. Because of the many uncertainties regarding development technology, no attempt is made to quantify water needs for tar sand development.
3. All water needed for oil shale development would come from the White River.
4. The amounts of water needed to develop two oil shale tracts would be the same as for developing tracts U-a and U-b (28,000 acre-feet).

### Water Quality Assumptions

All waste water from oil shale development would be confined and recycled so it would not reach surface or ground water.

### Land Tenure Adjustment Assumptions

Where valuable minerals can be identified, all mineral rights would be reserved on land identified for disposal, unless the land is exchanged for other land having equal value.



## CHAP. 4 - ENVIRONMENTAL CONSEQUENCES

### Air Quality Assumptions

1. The potential impacts to air quality from additional mineral leasing are based upon the probable production levels and mining and processing methods discussed previously in the minerals assumptions.
2. This air quality analysis was developed using several previously completed air quality analyses including the Uintah Basin Synfuels (UBS) Development analysis (Systems Applications 1983), the Combined Hydrocarbon Leasing EIS (BLM 1983f; Aerocomp 1984), and the Federal Oil Shale Management Program EIS (BLM 1983b; Dietrich et al. 1983). The analysis is based on the assumption that the high production level scenario of the Uintah Basin Synfuels Development EIS would occur over the next decade (BLM 1982b). This would represent the worst case analysis; however, eventual development may be somewhat less. The UBS analysis also considered the impact of the Bonanza Power Plant and the Plateau Oil Refinery as point sources.
3. The criteria for determination of the significance of impacts to air quality are related to the regulatory limitations set on air quality by the Prevention of Significant Deterioration (PSD) Regulations and the National Ambient Air Quality Standards (NAAQS) (Appendix 13).

### Socioeconomic Assumptions

A Denver Research Institute study identified a 10 percent annual population growth as being a general threshold level at which a government's ability to meet increased service demands often breaks down. This level was used in determining the abilities of communities in this document to accommodate increased growth.

The economic and social analyses were based on the assumption that certain interrelated projects outside the scope of this document would be constructed. The projects include those discussed in the high production level scenario of the Uintah Basin Synfuels Development EIS (BLM 1982b).

## GENERAL IMPACTS

### MINERALS

Concurrent development of separate mineral resources, such as oil shale, tar sand, and oil and gas, in the same vicinity, could result in delays to one or the other of the developments. Cooperation between individual developers working in multiple-lease areas would be necessary to avoid or minimize resource loss.

In certain areas, oil and gas and combined hydrocarbon leases would be subject to special mitigating measures which may be perceived as being unduly restrictive by certain people or organizations. These special mitigating

measures (reflected by the category system) would be of particular concern in areas with higher potential for oil and gas and tar sand resources. Table 4-7 and 4-8 compare category designations against favorable areas for oil and gas and tar sand resources. On the other hand, any development in these same areas may be considered to be unduly destructive by certain other people or organizations.

Approximately 12,000 acres of tar sand within the Hill Creek STSA overlaps with the NOSR II (Figure 2-10). The tar sands within this area would be in Category 4, no lease under all alternatives, as required by Executive Order dated December 6, 1916. Development of the energy resources in this area would be delayed indefinitely.

### Right-of-Way Corridors

A variety of developments ranging from oil and gas pipelines to roads and powerlines could be located within a designated corridor. An individual project could cause a surface disturbance from 30 to 100 feet or three to twelve acres per mile. Although, theoretically, a mile wide corridor could contain more than one hundred rights-of-way, current undesignated corridors contain a maximum of three. The types of impacts which could be expected from road construction would be similar to those previously described in the environmental assessment for the proposed highway from Bonanza to Vernal, Utah (BLM 1981a). Impacts of pipelines and electrical transmission lines would be similar to those described in environmental impact statements for Mapco's Rocky Mountain Liquid Hydrocarbons Pipeline (BLM 1980b) and the Moon Lake Power Plant Project (BLM 1981b).

Corridor designation would reduce anticipated environmental impacts from random or unplanned right-of-way networks by avoiding sensitive resource areas. Surface and visual disturbances associated with rights-of-way development would be confined to corridor areas. In some cases, costs to companies constructing the projects may increase an unquantified amount due to an increase in miles necessary to remain within the corridor. Processing of applications would be expedited through simplified environmental review.

Although environmental consideration is a criterion used in selecting corridor routes, not all resource conflicts could be resolved. Conflicts with important resource values are shown by alternative for each corridor segment (Appendix 9, Utility Corridor Segments by Alternative).

### Forage

This general section contains facts and impacts that are common to more than one locality or alternative. The facts and impacts are discussed in detail in this section and are merely referred to in the rest of the text.

The basic unit affected by the actions proposed under the respective alternatives is the ecological site. For purposes of analysis and application of management, the natural



## CHAP. 4 - ENVIRONMENTAL CONSEQUENCES

environment has been classified into sites. Each site is characterized by a particular climate, specific soils, a defined mix of plants, and a certain production potential. Elevation, aspect, and parent material have a direct bearing on these characterizing elements. Grazing animals (livestock, wildlife, wild horses) can have a significant effect on the plant mix or vegetation. Soils may also be affected but less directly. The degree of livestock grazing impact is directly related to the site. For instance, a desert site generally has lighter colored, less fertile soils and sparser vegetation than a mountain site. Hence, the impact of a given stocking level would be much greater on a desert site than on a mountain site.

The practice of allocating a portion of the annual forage production, (an amount in balance with plant needs) to consumptive use by livestock, is termed "proper use stocking". The concept of proper use allows the maintenance of plant food reserves, resists invasion of undesirable and unproductive plants, and allows for the increase of desirable plants and ground water supplies by improving ground cover and infiltration (Dyksterhuis 1951). Harvest of a portion of the annual plant production tends to stimulate growth and plant vigor, thus ensuring sustained yield by the plant. The level of use needed to attain sustained use is relative to the specific plant, the site, and the season of harvest. Proper use of major forage plants is usually set at 50 percent (BLM 1983g). However, it has been found that light use (21 to 40 percent) is generally more conducive to range improvement than moderate use (41 to 60 percent) (BLM 1983g).

Heavy grazing can have excessive impact on the root system of plants. Approximately one third of the root system must be replaced annually. Under heavy use, replacement cannot take place; hence, root volume and plant vigor decreases. The plant's ability to compete with less desirable plants, often weedy annuals, is reduced. The result is a decline in site condition (Hormay 1970, Dietz 1975). If excessive use of the vegetative cover occurs over a prolonged period, significant soil loss could occur. The basic site could be altered and long-term productivity reduced.

Hormay also pointed out that it is unrealistic to assume plants will be grazed at proper use levels simply by adjusting stocking levels. Livestock graze selectively both by plant species and by areas. This can result in over-use of preferred plants and accessible areas, especially floodplains, riparian zones, water service areas, trails, bedgrounds, sheltering areas, etc. Selective grazing under constant stocking levels combined with wide, natural variability in annual production, can result in severe use of preferred plants and grazing areas, particularly during dry years.

It has been determined that grazing during the spring growth period has the greatest impact on a plant's ability to maintain adequate levels of root reserves. As much as 75 percent of a plant's stored carbohydrates are required to initiate the first 10 percent of new growth (Stoddard and

Smith 1955). Grazing during any part of the growth period reduces the plant's carbohydrate reserves (Cook 1966).

Plant reproduction is a critical element in maintaining or improving desirable range conditions (Hormay 1970). Periodic deferment to allow production of seed and seedling establishment is vital for key plants which reproduce through seed.

Grazing practices, such as continuous grazing, which do not take into account the physiological requirements of the plant, would have a detrimental impact on site condition. The extent and intensity of the impact would relate to the stocking level.

Reductions in livestock numbers do not necessarily result in improvement of site conditions. If the selective pattern of grazing is not changed, the plant's physiological requirements still may not be met.

Complete deferment of grazing during the critical plant growth period (from plant beginning to the peak flowering stage) of key plants, on an annual basis, is the single most effective treatment in restoring and maintaining plant vigor. Systems which provide periodic deferment will also result in improvement, but on a more long-term basis.

Conversely, deferment of grazing during the critical spring growth period can impose hardships to livestock operations (see economic section, Resource Protection Alternative).

Winter grazing generally has less impact than other seasons of use because plants are dormant and carbohydrate reserves are least affected (Cook 1966, Hutchings and Stewart 1953). This is particularly true where grasses and forbs, which store food reserves in the roots, are key management species. Where shrubs are key forage plants, adverse impacts can occur when more than the current year's growth is harvested, since food reserves are stored in both the roots and twigs. Heavy winter grazing can result in depletion or loss of black sage, winter fat, or other species depending on the kind of grazing animal and intensity of use (Holmgren and Hutchings 1974).

The concept of rest rotation grazing comes closest to satisfying plant physiological requirements since systematic deferment is provided to maintain or improve plant carbohydrate reserves, seed production and seedling establishment. Under this system, livestock are also afforded periodic maximum use of the forage.

Impacts to the grazing animals can be somewhat different than plant response. In some instances rotation grazing can increase livestock stress and reduce animal gains. Yearling gains were higher under continuous grazing than under deferred grazing (Hormay 1970). However, where the ecologic range condition is poor or fair and the pasture overgrazed, livestock gains would be low but would increase as forage conditions improved (Hormay 1970). Where conditions were good, rotation grazing would reduce individual animal gains, but total production would increase due to greater carrying capacity and livestock numbers (Smoliak 1960).



## CHAP. 4 - ENVIRONMENTAL CONSEQUENCES

The manner in which the livestock are handled and the time allowed for pasture moves are important factors in animal stress (BLM 1983g). The degree of negative impact, resulting from a grazing system, relates to the arrangement and number of pastures and the increase in AUMs derived from following the grazing system. Where grazing systems are simple (having a minimal number of pastures and well-arranged moves), and a substantial increase in AUMs from the grazing system is gained, there is no net negative impact (BLM 1983g).

Some beneficial affects can accrue to livestock under rotation grazing. Early use can be made of rest pastures. Old growth can provide shelter to calves and can reduce incidences of grass tetany and scours. The impact of rest required for pastures (one and one-half to three years) in conjunction with vegetative treatment can be lessened, if the required rest can be scheduled with the normal rest treatment (Hormay 1970). Breeding success can be increased by subdividing large areas into pastures. Cows are concentrated and more available to bulls.

Ecologic condition and forage production can be improved through vegetative treatment. Prescribe burning of dense (25 percent or greater canopy), big sagebrush would greatly reduce canopy of big sagebrush. Grass cover would increase resulting in at least a doubling of forage production (Ralls and Busby 1979). The longevity of the effects depend on the grazing practices applied and moisture patterns.

Chemical treatment to control sagebrush has resulted in similar increases in production. Doubled yields were reported on study plots receiving 10 to 13 inches of annual precipitation (Nielson and Hinckley 1975). On sites where sagebrush was intermingled with browse species, damage occurred to aspen, chokecherry, serviceberry, snowberry, and bitterbrush (Blaisdell and Mueggler 1956). However, a large proportion of these species resprouted abundantly. Bitterbrush was consistently killed if sprayed when plants were less than 12 inches tall (Nielson and Hinkley 1975). Plants over 12 inches were only slightly damaged if spraying occurred prior to, or at the time of leaf origin. Significant increases in bitterbrush density can occur following chemical treatment. Forbs are generally reduced when treated with the herbicide 2-4-D (Nielson and Hinkley 1975). Of 38 species studied, 13 were moderately or severely damaged. Among them were balsam root, milk vetch, bluebell, and lupine (Blaisdell and Mueggler 1956).

Chaining pinyon and juniper allows release of understory forage or seeded species and can result in production of 200 to 700 pounds per acre (Valentine 1971). The debris and disturbance resulting from chaining can have an adverse effect on the aesthetics of the area. In areas with woodland value, it can also greatly reduce the value of woodland products. It has also been observed that the incidence of fire is greater in chained areas (Smith 1984).

### Cultural Resources

Construction and land modification activities could cause disturbance and modification to cultural resources that occur within the affected area. Impacts could include destruction or alteration of the resource base (sites, artifact and feature relationships, artifact displacement; removal, destruction and alteration of the surrounding environment) and the introduction of visual, audible and atmospheric elements out of character with the present environment. These impacts would result in a loss of scientific, educational and recreational values in a site or region and a loss of a portion of the resource base for future research or use. The loss of any information could have a significant impact on efforts to reconstruct the prehistory and history of the region, including data pertinent to many other types of anthropological studies and related disciplines. The majority of site disturbance could be avoided by proper placement of facilities. Where avoidance is not possible, data recovery by salvage excavation would mitigate most adverse effects. The total number and significance of the affected sites is unknown.

The loss of these values, on the other hand, would be partially offset by information gained from overall excavation and salvage programs. Such information would add to the growing data base for cultural resources in Utah and enhance our knowledge of prehistoric resource utilization and settlement patterns.

Indirect impacts would increase as a result of greater accessibility and local population increases. Recreational activities of two types, those intentional illegal activities associated with artifact collection and treasure hunting, and unintentional recreational use (hiking, hunting, off-road vehicles), could cause irreparable site damage. Both scientific and aesthetic site values would be lost as a result of these indirect impacts.

Site specific effects would be assessed when project specific locations, applied technologies, transportation and auxiliary need corridors are determined (BLM 1981b).

### Paleontology

The primary concentration of hydrocarbon development would occur in the Green River and Uinta Formations which are known to contain important fossils of fish, reptile, bird and mammal species. Construction activities could also provide new paleontological information.

An unknown amount of paleontological resources would be destroyed by ground-disturbing activities. Large scale mining activities could destroy or reveal buried paleontological resources. Those projects which disturb only the soil layer would have the least probability of destroying or discovering paleontological remains.

Collection and removal of fossils from known fossil areas would result from the anticipated population increase, resultant increase of people in known fossil areas, and the



## CHAP. 4 - ENVIRONMENTAL CONSEQUENCES

exposure of fossils by project construction. An unquantifiable amount of paleontological resources which have scientific and educational values would be lost.

### Endangered, Threatened, and Sensitive Plant Species

Surface-disturbing activities proposed for each alternative would have the potential to adversely affect endangered, threatened, and sensitive plant species and

their habitats. Impacts could include destruction of individual plants and destruction or degradation of occupied and potential habitats.

Mitigating measures requiring survey and clearance prior to proposed surface disturbing actions would reduce the potential for significant endangered and threatened plant or habitat loss. In some areas, resource development could not occur due to the presence of endangered or threatened species.



# **SPECIFIC IMPACTS**

## **CURRENT MANAGEMENT ALTERNATIVE**

### **MINERALS**

#### **Interrelated Impacts**

State leased and private oil shale and tar sand projects, (BLM 1982b) when considered collectively, would use a major portion of the available air quality increments and 36 percent of available White River water supply (refer to water use and air quality sections). Because of this, some future oil shale and/or tar sand programs located on public lands could be significantly delayed or eliminated. Air quality and water rights are handled through the State of Utah.

#### **Oil and Gas**

##### **BLM Impacts**

Total annual disturbance from drilling activities associated with 40 to 80 new wells would be 160 to 480 acres. Approximately 50 to 150 acres associated with non-productible wells would be subsequently available for reclamation. This level of activity and resulting disturbance would remain the same under every alternative. Drilling activities would continue to depend on market conditions.

The conflicts between other surface resources (reflected by the category system) and the potential and producible oil and gas areas (favorability system and KGS) are summarized by alternative in Tables 4-7 (Acreage Conflicts Between Category Designations and Oil and Gas Favorability Areas) and 4-8 (Acreage Conflicts Between Category Designations and Producible Oil and Gas Areas).

BLM's interim wilderness management policy could delay development of some existing and potential leases in the Winter Ridge Wilderness Study Area (UT-080-730, BLM 1979a), (Figure 1-4). The oil and gas resources could remain undisturbed until Congress makes a wilderness or non-wilderness determination.

#### **Oil Shale**

##### **BLM Impacts**

Anticipated production levels, environmental impacts, and mitigating measures associated with the White River Shale Project are analyzed in a detailed development plan, and will not be repeated here (Bechtel Petroleum 1981).

No additional leasing would occur.

#### **Tar Sand**

##### **BLM Impacts**

No tar sand development would be allowed under this alternative; therefore, no impacts resulting from tar sand development would occur.

#### **Gilsonite**

##### **BLM Impacts**

Current activity and production levels would continue to depend on market trends. A total of 5 to 45 mine staging areas would be developed on new Federal leases causing a surface disturbance of 15 to 135 acres over a 10 year period. This level of impact would remain constant under all alternatives.

#### **Sand and Gravel**

##### **BLM Impacts**

No significant use of sand and gravel would occur as a result of BLM proposed actions for this alternative. Over the next several years, surface disturbance resulting from sand and gravel development would be negligible, as removal would generally continue to occur in established removal areas.

#### **Building Stone**

##### **BLM Impacts**

Collection of building stone would continue at approximately the same levels as experienced in the past several years. Anticipated demand would not require the opening of new building stone areas or major expansion of old ones; therefore, little additional surface disturbance would occur.

### **RIGHT-OF-WAY CORRIDORS**

##### **BLM Impacts**

Approximately 61,500 acres would be formally designated as corridors under this alternative (Figure 2-5). Should these corridors be developed, anticipated resource conflicts would occur in crucial wildlife habitat, critical and severe erosion areas, habitat for threatened and sensitive plant species, floodplains, a river corridor, a public water reserve, visual resource management areas, and productive woodlands (Appendix 9, Utility Corridors and



Table 4-7

Acreage Conflicts Between Category Designations and Oil and Gas Favorability Areas

BIM Designation	Category 1 Standard Stipulations	Category 2 Special Stipulations	Category 3 No Surface Occupancy	Category 4 No Lease
Current Situation Alternative				
Oil & Gas				
Favorability F1 (low)	23,000	0	5,000	4,000
F2 (moderate)	653,000	159,000	21,000	12,000
F3 (high)	117,000	27,000	6,000	0
Resource Protection Alternative				
F1	3,000	26,000	3,000	0
F2	417,000	385,000	38,000	5,000
F3	69,000	68,000	10,000	3,000
Commodity Production Alternative				
F1	30,000	2,000	0	0
F2	813,000	29,000	3,000	0
F3	146,000	4,000	0	0
Balanced Use Alternative				
F1	28,000	3,000	1,000	0
F2	475,000	363,000	7,000	0
F3	102,000	47,000	1,000	0



# CHAP. 4 — CURRENT MANAGEMENT ALTERNATIVE

Table 4-8

Acreage Conflicts Between Category Designations and Producible Oil and Gas Areas (KGSs)

	Category 1 Standard Stipulations	Category 2 Special Stipulations	Category 3 No Surface Occupancy	Category 4 No Lease
Current Situation Alternative				
KGS*	334,000	92,000	16,000	8,000
Resource Protection Alternative				
KGS*	210,000	225,000	11,000	4,000
Commodity Production Alternative				
KGS*	435,000	15,000	0	0
Balanced Use Alternative				
KGS*	251,000	190,000	9,000	0

\*Producible oil and gas areas - Known Geologic Structure



## CHAP. 4 - CURRENT MANAGEMENT ALTERNATIVE

Segments by Alternative). However, because the number of rights-of-way applications that would be received over the next several years is not known, anticipated impacts cannot be quantified. Site specific environmental documentation would be prepared for construction within the 170 miles of proposed corridors when specific right-of-way applications are received.

The informal corridors considered for this alternative would not be sufficient to accommodate anticipated industry requirements.

### FORAGE

#### Interrelated Impacts

There are two interrelated projects which will effect the forage resource in the BCRA: the White River Shale Project and the White River Dam Construction (Bechtel Petroleum, Inc. 1981), (BLM 1982c). These impacts will occur within the Bonanza-Rainbow Locality; five allotments will be affected (Table 4-9, Forage Impacts from Interrelated Projects).

The permittees in the Little Emma and White River Bottoms allotments will be the only operators that are significantly affected. Construction and spent oil shale disposal will eliminate 14 percent of the forage in the Little Emma allotment. The loss of forage will exceed ten years in duration; however, rehabilitation may eventually eliminate the loss. The White River Bottoms allotment will lose 21 percent of the available forage. Since this area will become part of the White River Dam Reservoir, the forage will be permanently lost.

#### BLM Impacts

**Blue Mountain Locality:** Authorization of 5,835 AUMs for livestock and 1,768 AUMs for wildlife would continue under this alternative. A gradual decline in ecological condition would continue on three allotments: Blue Mountain AMP, Point of Pines, and Stuntz Valley. Three other allotments would remain static (Appendix 14, Anticipated Trend in Ecological Condition). Approximately 7,200 acres (19 percent) would decline. Of the areas in decline, approximately 10 percent would change a full condition class (Appendix 16, Anticipated Changes in Ecological Condition Class). The remaining 30,800 acres would remain in a static condition. This decline would occur mainly in the mountain stony loam and mountain loam sites (Appendix 10, Ecological Sites and Conditions by Locality). Sagebrush would continue to increase on the sagebrush treated areas because no treatment of sagebrush would take place. The apparent decline in condition results from three factors: the current pattern of heavy utilization of forage by livestock and wildlife, continuous season long use, and the natural tendency of sagebrush to dominate over grass.

**Bonanza-Rainbow Locality:** Continuation of the present grazing practices and 37,352 AUMs for livestock, 762 AUMs for antelope, 480 AUMs for wild horses, and an unknown portion of 12,784 AUMs for deer would not change the existing trend in ecological condition. Six allotments (Antelope Draw, Asphalt Draw AMP, Hells Hole, Olsen AMP, Stateline, and West Deadman), would continue to improve and 19 allotments would remain stable. Four allotments would continue to decline: Badlands, Jensen, Kane Hollow, and Spring Hollow Appendix 14 (Anticipated Trend in Ecological Condition) and Appendix 5 (Forage Actions by Alternative). Approximately 24,800 acres would continue to decline, 363,600 acres would remain static and 244,900 acres would continue to improve. A net effect for the locality would be a change of less than five percent in ecological condition class from fair to good (Appendix 16, Anticipated Change in Ecological Condition Class).

Areas that are receiving light or no grazing use due to a lack of water, licensed non use, or other limiting factors, would continue to show an improvement in ecological condition. Areas where livestock tend to concentrate (near water, bedgrounds, etc.), or where heavy spring use occurs, would continue to decline or remain static. Season long use would affect plant vigor as discussed in the general impact section. The present practice of grazing fewer animals (39 percent nonuse) would decrease the potential for forage impacts resulting from spring grazing.

Both antelope and wild horses would continue to consume forage which has been allocated for livestock use. Based upon the existing level of livestock nonuse, the forage resource would not be overutilized; however, the improvement in ecological condition that would be expected through livestock nonuse would not be attained.

In this locality, 308 AUMs of forage would be lost as a result of mineral developments (Appendix 15, Forage Impacts).

**Book Cliffs Locality:** The trend of ecological condition would remain unchanged with current grazing practices and allocations of 17,351 AUMs for livestock, 108 AUMs for wild horses, an unknown portion of 12,784 AUMs for deer, and an unknown portion of 3,192 AUMs for elk. Three allotments (Atchee Ridge AMP, Horse Point AMP, and Sweetwater AMP) would continue to have an improvement in ecological condition; four allotments would remain in a static ecological condition. No allotments would decline in overall ecological condition (Appendix 14, Anticipated Trend in Ecological Condition). Approximately 4,400 acres would decline in ecological condition, 86,800 acres would remain in a static condition, and 212,900 acres would continue to improve. The net improvement would be a change of less than five percent in ecological condition class (Appendix 16, Anticipated Trend in Ecological Condition Class).

Four allotments (Atchee Ridge AMP, Horse Point AMP, Sweetwater AMP, and Winter Ridge AMP) totaling approximately 270,200 acres, would operate under grazing systems



## CHAP. 4 - CURRENT MANAGEMENT ALTERNATIVE

Table 4-9

### Forage Impacts From Interrelated Projects

		Approximate	Approximate	Percentage
		Acres Lost	AUMs Lost	of Active
<u>Allotment Name &amp; Number</u>				<u>Preference</u>
White River Shale Project				
Hells Hole	8819	470	27	1%
Little Emma	5852	2,475	653	14%
Subtotal		2,945	680	
White River Dam Project				
White River				
Bottoms	5850	640	103	21%
State Line	5863	285	41	2%
Antelope Draw	5854	597	86	1%
Subtotal		1,522	230	
Total		4,467	910	



## CHAP. 4 - CURRENT MANAGEMENT ALTERNATIVE

which rotate grazing use to avoid the impacts of spring grazing upon plant vigor. Three allotments (Book Cliffs Pasture, McClelland, and Westwater Point) approximately 11 percent of the locality, would operate with season-long grazing use Appendix 5 (Forage Actions by Alternative). The changes in ecological condition resulting from grazing distribution, licensed nonuse (25 percent), and season-long grazing would be similar to the impacts described for the Bonanza-Rainbow Locality.

A lack of water on many of the ridges would keep both livestock and wildlife from using the existing forage, even though it was allocated during the 1960's (Oldroyd 1984). Forage consumption would thus be increased in areas in proximity to usable water. The nonuse taken by livestock operators and the existing wildlife populations, would not result in enough cumulative demand for forage to adversely affect range trend. Localized problems in range condition, totaling approximately 4,400 acres, would exist (Appendix 11, allotment Statistics).

Wild horses would continue to use approximately 108 AUMs which have been allocated to livestock. No competition would occur for the forage because of the existing livestock nonuse. The total improvement in ecological condition that would be expected to result through livestock nonuse, would not be attained.

Forage for elk (approximately 3,200 AUMs) would continue to be provided from forage that was initially allocated to deer (approximately 38,800 AUMs). The average deer use in herd unit 28A would be approximately 12,800 AUMs. This leaves approximately 22,800 AUMs allocated for, but unused by wildlife in deer herd unit 28A and elk herd unit 21.

Within this locality, approximately 224 AUMs would be lost through mineral developments (Appendix 15, Forage Impacts).

**Hill Creek Locality:** Continuation of the present grazing practices and 6,442 AUMs for livestock, 1,881 AUMs for wild horses, an unknown portion of 12,784 AUMs for deer, and an unknown portion of 3,192 AUMs for elk would not change the present trend in ecological condition. No allotments would decline. Three allotments (Lower Showalter, Oil Shale, and Ute) would continue to improve; nine allotments would remain static (Appendix 14, Anticipated Trend in Ecological Condition). Approximately 107,200 acres would remain in a static condition and 32,700 acres would continue to improve. A net improvement would be a change of less than 5 percent in ecological condition class (Appendix 16, Anticipated Trend in Ecological Condition Class).

Two allotments (Green River AMP and West Tabyago AMP), totaling approximately 32,100 acres, would operate with grazing systems that would rotate livestock use to avoid the impacts of spring grazing. Ten allotments (approximately 77 percent of this locality) would operate with season-long grazing use (Appendix 5, Forage Actions by Alternative). The changes in ecological condition resulting from grazing distribution, licensed nonuse (49 percent), and

season-long grazing would be similar to the impacts described for the Bonanza-Rainbow Locality.

Wild horses would consume approximately 1,880 AUMs that have been allocated for livestock use. Elk would also consume an unquantifiable amount of forage which has been allocated for livestock use. The expected total forage consumption by all animals would be less than the carrying capacity of the range, due to the large percentage of livestock non use taken by the permittees. The improvement in ecological condition that would be expected through nonuse would not be as great.

Within this locality, approximately 37 AUMs would be lost through mineral developments (Appendix 15, Forage Impacts).

## WILDLIFE/WILD HORSES

### BLM Impacts

The utilization of 18,506 AUMs of existing forage from BLM lands by big game species, including 1,325 AUMs from Dinosaur National Monument, and approximately 2,469 AUMs by wild horses, would be sufficient to support big game and wild horse forage demands.

The distribution of the various wildlife species would be: 611 antelope (475 at Bonanza-herd unit 7, 136 at East Bench); 7,700 mule deer (1,500 at Blue Mountain-herd unit 26, 6,200 at Book Cliffs-herd unit 28A); 500 elk (all located at Book Cliffs-herd unit 21); 206 wild horses (40 at Bonanza, 157 at Hill Creek, 9 at Winter Ridge). Wild horse populations would continue to be managed at all 3 locations—Bonanza, Hill Creek, and Winter Ridge. Projected oil and gas development (up to 80 new wells per year) would affect crucial antelope, mule deer, elk, and wild horse habitat. The majority of the animals affected would be displaced into surrounding areas (Hamilton 1984). Forage lost to development is shown in (Appendix 15, Forage Impacts).

While disturbing existing habitat conditions for the short term, over the long term prescribe burns would improve wildlife habitat and increase the quality of available forage. Development of 10 to 30 water projects would result in a better distribution of big game species and result in utilization of suitable areas of habitat and forage not currently in use.

Threatened and endangered wildlife species would not be affected by development as detailed in this alternative.

## WOODLANDS

### Interrelated Impacts

With an annual harvest rate of 6,500 cords, demand would exceed current wood growth by 2,400 cords by 1995. In 1982, firewood demand from the population of the Uintah Basin amounted to 2,200 cords per year. By 1995, the



## CHAP. 4 - CURRENT MANAGEMENT ALTERNATIVE

increased population associated with interrelated projects proposed in the Basin could increase demand by 4,300 cords for a total of 6,500 cords per year.

Assuming a harvest rate of 6,500 cords per year and an average stocking of 11 cords per acre, woodlands would be eliminated at a rate of approximately 220 acres per year. The conversion of woodlands to rangeland as a result of harvest activities would eventually result in additional forage for livestock and wildlife.

### BLM Impacts

Because no actions which would result in large population increases are proposed for this alternative, demand for firewood in the BCRA would not significantly increase.

## RECREATION

### Interrelated Impacts

By 1995, the increased population associated with interrelated projects proposed in the Basin could increase the number of BCRA visitor hunting days by an additional 3,650 to 10,420 visitor days. As a result, hunter success would likely decline by an unquantified amount, thereby lessening the recreational experience.

In 1982, participation for all other forms of recreation such as small game hunting, river floating, and ORV use was estimated to be 7,200 visitor days. An estimated increase of 12,000 for a total of 19,200 visitor days is expected by 1995. The impact of increased visitor use will affect ORV use. Since the Current Management Alternative proposed no ORV travel restrictions, ORV travel is expected to increase by an unquantified amount, especially in areas close to Vernal and adjacent to developed energy sites.

It would be expected that damage to vegetation and soil, harassment to antelope and wild horse herds in the Bonanza area, and disruptions to the deer herd on their crucial winter range on Lower McCook Ridge would become a growing problem.

Sufficient undeveloped areas would be available to accommodate the increase in dispersed activities such as sight-seeing, camping and river floating. However, there would be a slight, undetermined decrease in solitude in popular use areas and a slight, undetermined increase in vandalism of both public and private property.

### BLM Impacts

Continuation of BLM current management would not change demand for outdoor recreation except for a small (400 visitor day) increase in big game hunting by the year 1995.

No large-sized surface disturbances are anticipated that would alter VRM class standards.

Retention of the Book Cliffs Mountain Browse Natural Area would continue to provide a useful vegetation study

plot where long-term vegetative changes on managed lands could be compared to untreated areas.

## FIRE MANAGEMENT

### BLM Impacts

Employment of full suppression of wildfire would protect 1,070,000 to 1,075,000 BCRA acres, safeguard private property, and prevent the spread of wildfire to non-Federal lands.

Prescribe burns, while disrupting the existing conditions, would, in the long term, improve overall forage quality, benefiting livestock and wildlife.

## WATERSHED

### Water Use

#### Interrelated Impacts

Interrelated projects would annually deplete 167,000 acre-feet from the White River. The depletion is 36 percent of the average annual flow and exceeds by 58,000 acre-feet the capacity of White River Dam. This would require proponents of some projects to purchase water rights from other sources.

### BLM Impacts

Implementation of any of the BLM actions, would not cause a significant increase in water use.

### Water Quality

#### Interrelated Impacts

Depleting an additional 167,000 acre-feet of water from the White River per year, would increase the total dissolved solids (TDS) concentration at the mouth of the White River by an estimated 12 milligrams per liter (mg/l). At the Imperial Dam, the TDS increase would be approximately 5 mg/l.

### BLM Impacts

BLM actions would have no significant impacts on water quality.

### Soils

#### BLM Impacts

The construction of up to 500 detention-retention dams on the 10,000 acres of severe or critical erosion areas, would reduce soil loss by 64,000 tons over the next decade. Surface disturbances caused by dam construction would



## CHAP. 4 - CURRENT MANAGEMENT ALTERNATIVE

increase wind and water erosion by an expected insignificant, but undetermined, amount for three to five years.

Under this alternative, severe and critical erosion areas would not be protected from oil and gas activities. However, the small amount of surface disturbance (1,200 to 3,800 acres during the next decade) would not significantly affect cumulative soil erosion, although localized erosion problems could occur.

No other BLM actions would significantly affect soils.

### Floodplains

#### BLM Impacts

Floodplains would not be significantly affected by implementation of any BLM actions.

### Boulevard Ridge Study Area

#### BLM Impacts

Management of the watershed study area would continue to provide scientific data.

## LAND TENURE ADJUSTMENT

#### BLM Impacts

Land ownership could change on up to 1,360 acres available for exchange or sale (Figure 2-7). No applications or specific proposals have been received, so a detailed impact analysis is not possible at this time. However, no significant changes in environmental condition or land management practices would result if exchanges or sales occurred as anticipated for this alternative. Site specific environmental analyses would be done when proposals are received.

## AIR QUALITY

#### Interrelated Impacts

Air quality in the region of the BCRA is expected to deteriorate to some degree over the next ten years, without any further Federal leasing actions. Air pollution emissions from resource development, conversion activities and population growth, and the resulting air quality increment consumption, were analyzed in the Uintah Basin Synfuels Development EIS (BLM 1982b). The emission sources analyzed included units one and two of the Bonanza Power Plant, the White River Oil Shale Project, the Plateau Refinery Expansion, and seven Utah Synfuels proposals, assumed to be on line by 1990. Synfuel production levels analyzed were 320,500 bpd for the high level alternative, and 121,400 bpd for the low production level.

It was determined that air quality impacts resulting from the direct emissions of these projects would not exceed applicable air quality standards and PSD increments. However, near source, maximum 24-hour average total suspended particulate (TSP) concentrations, would be close to the Class II PSD incremental increase allowances.

Secondary emission sources related to population growth and related activities were also analyzed. The analysis considered the potential limitation of the prevention of significant deterioration (PSD) Class I and Class II standards, as well as impacts to areas of special concern, including the Uintah and Ouray Indian Reservation, Dinosaur National Monument, and the High Uintas Primitive Area.

The Class II increment limitations could be exceeded in the Dinosaur National Monument and the Uintah and Ouray Indian Reservation. The impacts to Dinosaur National Monument would be largely from secondary particulate emission sources, whereas impacts to the Uintah and Ouray Indian Reservation would be the result of both primary particulate emissions from the synfuels facilities and secondary emissions. Both the 24-hour maximum and annual average incremental limitations could be exceeded in these areas. The towns of Vernal, Utah and Rangely, Colorado, would also be significantly affected, primarily from secondary emissions.

Because most of these particulates are large, they are not respirable and are believed to have little health effect. If the fugitive dust from secondary sources were to be included in the consumption of the PSD increments for TSP, and mitigation measures, such as paving roadways, were not employed, it is quite likely that PSD Class II increments for TSP would be exceeded in much of the region.

The predicted high TSP concentrations from secondary emissions are not expected to greatly reduce regional visibility; but, they would cause local dust clouds. Worst-case reductions in regional visual range are anticipated to occur in the summer when sulfate formation rates are highest. Worst regional visual range reduction is projected to be less than 10 percent, and would be principally due to sulfate aerosol formed in the atmosphere from regional sulfur dioxide (SO<sub>2</sub>) emissions from synthetic fuel facilities and power plants. For up to 50 days annually, yellow-brown atmospheric discoloration, resulting from emissions of nitrogen oxides from synthetic fuel facilities and power plants, may be visible on the Uintah and Ouray Indian Reservation and at Dinosaur National Monument.

Significant, local reductions in visual range could occasionally be observed in stagnant haze layers, principally in the winter. These hazes would be caused by TSP emissions from industrial facilities, wind-blown dust, dust from roadways, and smoke from residential wood stoves and fireplaces. The hazes would be localized and would not affect regional visibility.



## CHAP. 4 - CURRENT MANAGEMENT ALTERNATIVE

That amount of air quality degradation permitted for the interrelated projects is irretrievably committed for the life of those projects. Some degradation of air quality would be irreversible due to established urbanization in the area after closure of the oil shale and tar sand facilities.

### BLM Impacts

As no major new projects are considered in this alternative, the continuation of BLM's current management would have no significant impact on the region's air quality.

## SOCIOECONOMICS

Methodologies and computations that were used to estimate economic impacts are discussed in Appendix 12 (Methodology for the Economic and Social Analysis).

### Economic Conditions

#### Interrelated Impacts

The local economic conditions would be affected by development of the interrelated projects identified in Assumptions and Guidelines.

The Uintah Basin Synfuels EIS analyzes various levels of development associated with these projects. The reader is referred to that document for an in depth analysis of the anticipated socioeconomic impacts of synfuel development in the Uintah Basin. In summary, that analysis suggests that the most challenging consequence of the development of the synfuels projects would be the need for orderly management of population growth and its attendant factors. The Uintah Basin population is projected to increase to as much as 151,739 by 1995, or about two and one-half times its present number. This could create problems of substantial magnitude for local city and county governments, as well as for the Ute Indian Tribal Council. To meet this challenge would necessitate a cooperative effort by the synfuels project developers, the governing entities, and the majority of the citizens involved.

### BLM Impacts

Management decisions associated with the Book Cliffs RMP would not alter the interrelated projects or their resulting impacts.

Implementation of the Current Management Alternative would result in the retention of the existing oil and gas category system. As a result, oil and gas development would continue in much the same manner and production level as in the past, and would continue to be a reflection of current market conditions. Under this alternative, the petroleum industry would continue to provide 71 percent of the total employment in the mining sector of Uintah County, 16 percent of the total county employment, and 26 percent of total county personal income. Duchesne County would continue to receive 30 percent of it's employment

and 44 percent of it's income from the petroleum industry. These figures are averages, recognizing that the BCRA would continue to experience minor "boom" and "bust" cycles, which would affect employment and personal income figures.

For the foreseeable future, gilsonite, sand and gravel, and miscellaneous mineral activities would continue as they have for the past several years, employing about 300 persons and contributing a minor amount of employment and personal income to Uintah County residents (Table 3-5).

Implementation of this alternative would not result in the development of the tar sand resource in the BCRA and oil shale development would be limited to the U-a and U-b leases. Therefore, potential employment and revenues associated with tar sand and additional oil shale development would not be realized in the foreseeable future.

None of the quantifiable management actions under this alternative would cause any significant change to livestock operators or existing livestock operations. The public rangeland forage available to many livestock operators would continue to be decreased by ongoing mineral-related activities (see forage section). These losses would not affect existing forage use or rancher income; however, they would reduce the potential carrying capacity of several ranches. Since one of the major factors affecting operator wealth is ranch carrying capacity, these forage losses could reduce ranch values. Since base properties are used as collateral for some types of loans, a reduction in ranch value could have some effect on the total indebtedness allowed.

Since the aggregate rancher income is not expected to change under this alternative, the rancher's ability to repay a loan should not be affected.

Recreation activities would not be significantly affected by BLM recreation management actions. However, estimated population increases, as projected, would increase recreational activities and activity days. Expenditures, income, and employment in the impact area would correspondingly increase as more hunters are attracted to the area. By 1995, BLM actions would result in a 400 hunter day increase and an \$18,000 hunter expenditure increase.

### Social Conditions

None of the management actions discussed in implementing the Current Management Alternative would noticeably change the social environment of local communities.

## TRANSPORTATION

### Interrelated Impacts

Increases in traffic volumes and changes in levels of service on the four major area highways, resulting from interrelated projects, are shown in Table 4-10. By 1995, all roads, with the exception of County Road 262 between U.S. 40 and Bonanza, could have an unsatisfactory level of



## CHAP. 4 - CURRENT MANAGEMENT ALTERNATIVE

service which would result in a possible accident rate increase, traffic congestion, and road deterioration.

If a new town were to be constructed at Westwater, in Grand county, as discussed in the economics section, a new road up the south slope of the Book Cliffs Mountains to the BCRA, would be required. BLM actions alone would not be the determining factor in deciding if such a town and highway would be built. If the new town and highway are constructed, the projected traffic volumes for the four major highways in the BCRA, could be reduced by an unknown amount.

### BLM Impacts

Under this alternative, BLM impacts to transportation would be insignificant and the levels of service would not change from those discussed above.

## UNAVOIDABLE ADVERSE IMPACTS

Forage on an estimated 5,135 acres would be lost as a result of mineral developments. Ecologic condition would continue to decline on 38,600 acres.

Wildlife and wild horses displaced by mineral development into surrounding areas of suitable habitat could be subject to crowding, stress, and competition for forage, water, and cover. In addition, an unquantifiable amount of habitat surrounding each oil and gas well would be abandoned by most wildlife species. This impact could be significant if it is concentrated in or near deer and elk fawning and calving areas.

An unquantifiable increase in soil erosion and loss would result from oil and gas activity.

## IRREVERSIBLE AND IRRETRIEV— ABLE COMMITMENTS OF RESOURCES

Minerals mined and subsequently consumed or left underground as unrecoverable would be irretrievably lost.

Soil lost to oil and gas activity would be an irretrievable loss.

Big game losses through displacement from habitat, or illegal killing would be irretrievable. Despite increased losses of individual animals, vitality of the herds would be expected to be maintained.

## SHORT-TERM USE VERSUS LONG-TERM PRODUCTIVITY

Because of constantly improving mining technology and practices, present mineral production would be less efficient than future mineral production.

In areas where grazing has resulted in poor ecological condition, the loss of topsoil or source of seed for perennial plants, could reduce the long-term productivity of the range.

Burning 5,000 to 10,000 acres of browse would result in short-term losses of forage and habitat, but both would be improved in the long term.

Mineral development and woodland harvest would result in short-term abandonment of wildlife habitats. These habitats would again be occupied following satisfactory reclamation.

Harvesting woodland products to meet demand would result in an overcut of mature trees and reduced productivity in the long-term.

Implementing watershed treatments on 10,000 acres would cause short-term increases in soil erosion, but reduce soil loss by 64,000 tons over the next 10 years.

## CUMULATIVE SUMMARY

The cumulative impacts to minerals would be the same as the BLM impacts previously discussed for this alternative.

Ecological condition would improve in 12 allotments, decline in 7 allotments, and remain static in 35 allotments. Approximately 36,400 acres would decline, 588,400 would remain static, and 490,500 would improve. An estimated 576 AUMs would be lost due to mineral development activities. Forage actions would result in the improvement of approximately two percent of the lands in fair ecologic condition to good condition.

The cumulative impacts upon forage resulting from both the interrelated projects and the BLM projects would not differ significantly from the impacts discussed in the BLM Impacts section. The Little Emma allotment would have a forage loss of 15 percent. The White River Bottoms allotment would have a forage loss of 21 percent. The State Line and Antelope Draw allotments would receive forage decreases of approximately two percent, and all other allotments would lose one percent, or less, of their available forage. Livestock active preference would be decreased by 910 AUMs, from 102,915 to 102,005 AUMs.

The cumulative wildlife impacts would be the same as the BLM Impacts previously discussed.

Sufficient undeveloped areas would be available to absorb the increase in dispersed activities such as sight-seeing, camping and river floating. However, there would be a slight undetermined decrease in solitude in popular use areas and a slight undetermined increase in vandalism of both public and private property.

Annual depletions from the White River would increase by 167,000 acre-feet. Colorado's undetermined White River water entitlements, could further reduce the water supply available in Utah.

Impacts to water quality, air quality, socioeconomics, and woodlands are the same as those described for interrelated projects.

Transportation impacts would not change from those impacts caused by baseline and interrelated projects as identified in Table 4-10.



## CHAP. 4 —CURRENT MANAGEMENT ALTERNATIVE

Table 4-10  
Projected Average Daily Traffic Levels for Current  
Baseline and Interrelated Projects

Highway Segment	1985			1995		
	Baseline	Interrelated	Total	Baseline	Interrelated	Total
<u>Utah 88</u>						
From Ouray to U.S. 40	391	4,268	4,659	501	6,762	7,263
<u>U.S. 40</u>						
From Utah 88 to Vernal	3,955	8,907	12,862	4,739	16,430	21,169
From Vernal to Jensen	5,356	7,620	12,976	6,542	14,158	20,700
From Jensen to County 262	2,348	3,411	5,759	2,868	6,319	9,187
From County 262 to Colo. Line	1,975	3,404	5,379	2,412	6,249	8,661
<u>County 262</u>						
From Utah 45 to U.S. 40	323	750	1,073	413	1,131	1,544
<u>Utah 45</u>						
From Vernal to County 262	NA	4,107	-	NA	8,486	-

Source: Uintah Basin Synfuels Development Final EIS

NA = Not Available



# RESOURCE PROTECTION ALTERNATIVE

## MINERALS

### Oil and Gas

#### BLM Impacts

Total annual production and associated disturbance would remain approximately the same as discussed in the Current Management Alternative. The conflicts between the other surface resources (reflected by the category designations) and the potential and producing oil and gas areas are summarized in Tables 4-7 and 4-8.

A slight potential exists for oil and gas developments inadvertently being damaged or destroyed by oil shale construction activities such as mining equipment striking subsurface casing. Damage could generally be avoided if lease holders cooperate with each other when development occurs.

### Oil Shale

#### BLM Impacts

Approximately 80,000 bpd could be produced on two future oil shale tracts located within the priority management area (Figure 2-9). Approximately 1,100 acres would be disturbed (nonreclaimed) at any given time during the production phase.

The priority management area identified for underground oil shale development could limit management and industry flexibility in locating future oil shale tracts. In addition, priority management areas identified for in situ development would not be immediately available and could result in an unquantifiable delay of a Federal in situ oil shale lease program.

### Tar Sand

#### BLM Impacts

Approximately 5,000 to 10,000 bpd could be produced on future hydrocarbon leases. Approximately 1,400 to 2,200 acres would be disturbed due to mining and related construction activities.

Special mitigating measures (lease categories) could affect tar sand development in a similar manner as discussed for oil and gas development. Certain areas (categories three and four) would not be available for tar sand development. However, by not developing these areas, conflicts with other resources would be avoided. The conflicts between the surface resources (reflected by the category designations) and the potential tar sand areas are

shown in Table 4-11 (Tar Sand: Average Conflicts Between Category Designations and Potential Development Areas). Development of tar sands in Category 3 areas is also not possible with present technology. Approximately 32 percent of public land within the three STSAs would not be available for tar sand development (Table 4-11). In addition, tar sand within the Naval Oil Shale Reserve is withdrawn and reserved for the U.S. Navy (Figure 1-4).

### Gilsonite

#### BLM Impacts

Production levels and associated surface disturbance would remain the same as discussed in the Current Management Alternative.

Unleased gilsonite veins are known to exist within priority management areas for oil shale. Some of these veins could be eliminated from potential development by mining activities, spent shale disposal areas, retention dams and reservoirs, plant sites, etc.

### Sand and Gravel

#### BLM Impacts

Because no additional areas would be opened to sand and gravel development, no environmental impacts to Federal land within the BCRA would occur. However, demand of 10 to 15 acres of sand and gravel material sites, due to BLM implemented actions, could occur. Sand and gravel products would have to be derived from a non-Federal source within the BCRA or from lands outside of the BCRA.

### Building Stone

#### BLM Impacts

No environmental impacts would occur because collecting areas would be closed.

The public would have to use other types of building stone from areas outside the BCRA. No similar substitute sources are available for this type of stone.

## RIGHT-OF-WAY CORRIDORS

#### BLM Impacts

Under this alternative, rights-of-way within designated corridors could affect 46,000 acres (Figure 2-11). Major resource conflicts would generally be avoided but could still occur in certain areas and are indicated in the affected



# CHAP. 4 — RESOURCE PROTECTION ALTERNATIVE

Table 4-11  
Tar Sand: Acreage Conflicts Between Category Designations and Potential Development Areas

STSA		Resource Protection			Category 3 No Surface Occupancy
		Category 1 Standard Regulations	Category 2 Special Stipulations	Category 3 No Surface Occupancy	
PR Spring	Low Potential	4,000	43,000	31,000	
	Moderate Potential	10,000	56,000	39,000	
Hill Creek	Low Potential	4,000	12,000	0	
	Moderate Potential	3,000	1,000	0	
Raven Ridge	Low Potential	9,000	4,000	0	
	Moderate Potential	1,000	0	0	
Total		31,000	116,000	70,000	
Commodity Production					
PR Spring	Low Potential	72,000	3,000	0	
	Moderate Potential	107,000	1,000	0	
Hill Creek	Low Potential	16,000	0	0	
	Moderate Potential	4,000	0	0	
Raven Ridge	Low Potential	13,000	0	0	
	Moderate Potential	1,000	0	0	
Total		213,000	4,000	0	
Balanced Use					
PR Spring	Low Potential	45,000	12,000	23,000	
	Moderate Potential	55,000	44,000	4,000	
Hill Creek	Low Potential	8,000	8,000	0	
	Moderate Potential	4,000	0	0	
Raven Ridge	Low Potential	9,000	4,000	0	
	Moderate Potential	1,000	0	0	
Total		122,000	68,000	27,000	



## CHAP. 4 — RESOURCE PROTECTION ALTERNATIVE

resource section (Appendix 9, Utility Corridors and Segments by Alternative). Site specific environmental documentation would be prepared for construction within the 150 miles of proposed corridors when specific right-of-way applications are received.

### FORAGE

#### BLM Impacts

**Blue Mountain Locality:** Authorization of 3,725 AUMs for livestock and 2,413 AUMs for wildlife would result in an improvement in ecological condition in five of the six allotments in this locality. Only the Cub Creek allotment would remain in a static ecological condition (Appendix 14, Anticipated Trend in Ecological Condition). Approximately 29,900 acres (79 percent) would improve and the remaining 8,100 acres would remain in a static ecological condition; no range would decline in condition. The net improvement would be a change of approximately 10 percent in ecological condition class, from fair to good (Appendix 16, Anticipated Change in Ecological Condition Class).

Improvement in plant vigor and ecological trend would occur primarily on mountain loam and mountain stony loam sites, as well as floodplains and riparian areas. Sagebrush would remain static or decline by a slight (unquantifiable) amount. The improvement in ecologic trend would result from deferment of spring livestock use (five allotments) and decreases of livestock use in floodplains and riparian areas (Green River allotment). The total livestock decreases would amount to approximately 2,110 AUMs (Appendix 5, Forage Actions by Alternative).

Forage allocated for deer would increase by 1,413 AUMs above the current allocated use of 1,000 AUMs for a total of 2,413 AUMs. This would be 1,004 AUMs less than the prior stable numbers objective (3,417 AUMs). By keeping the wildlife forage approximately 29 percent below the objective level and the livestock forage approximately 36 percent (2,062 AUMs) below active preference, the locality would be under allocated approximately 650 AUMs. This decrease in grazing pressure would result in a reversal in the range ecological trend from a decreasing to an increasing condition.

Development of four reservoirs, a spring, and one mile of pipeline within the Blue Mountain AMP, Green River, Stuntz Valley, and Point of Pines allotments, would allow better distribution of livestock and wildlife grazing.

Development of water in areas that have received light grazing pressure due to their distance from water, would be more efficiently utilized. Areas where grazing was previously concentrated due to the availability of water, would not be as heavily grazed. Reduced grazing pressure would result in improved ecological condition of the range.

Minerals development would result in a loss of 7 AUMs (Appendix 15, Forage Impacts).

**Bonanza-Rainbow Locality:** Authorization of 29,191 AUMs for livestock, 1,390 AUMs for antelope, 600 AUMs for wild horses, and an unknown portion of 37,113 AUMs for deer would improve ecologic condition throughout this locality. Twenty-seven of the allotments would improve in ecological condition. Only two allotments (Walker Hollow and White River) would remain in a static condition (Appendix 14, Anticipated Trend in Ecological Conditions). Approximately 534,200 acres would show improving trend and 99,000 acres (16 percent) would remain static. No declines in overall ecological condition would occur in this locality. The net improvement would be 10 percent in ecological condition class, from fair to good (Appendix 16, Anticipated Change in Ecological Condition Class).

Improvements in ecological condition would result from several actions. Decreasing livestock use from 37,352 AUMs to 29,191 AUMs would result in 22 percent fewer livestock than currently use the range. Deferment of livestock use during the critical spring growth period on 27 allotments would eliminate a demand of 6,918 AUMs, thus avoiding the impacts of spring grazing. The other two allotments (White River and Walker Hollow) would not have any spring grazing and also avoid the impacts of spring grazing. Improvement of riparian areas and floodplains would result from decreasing livestock use by 479 AUMs within the White River Bottoms allotment. Development of three springs, one guzzler, and 17 reservoirs, would distribute livestock, wildlife, and wild horses more evenly within 12 allotments. The distribution would allow better utilization of forage, as described in the Blue Mountain locality.

The proposed use of 29,191 AUMs would represent 48 percent of the original allocation. Due to the current level of nonuse (32,132 AUMs), this decrease would result in 8,161 fewer livestock AUMs (22 percent) below average use. These decreases would have significant economic impacts upon the livestock permittee's operations. Refer to the socioeconomic section under this alternative.

Competition for forage between deer in herd unit 26 and livestock would decrease by 255 AUMs on four allotments (Cocklebur, Jensen, Miners Gulch, and Powder Wash). Heavy grazing pressure would thus be eliminated in those areas. No competition for forage would occur in the remaining 25 allotments. Forage allocated for deer in the 1960's would be adequate.

Wild horses would be authorized 600 AUMs. That amount of forage would be available due to the 22 percent decrease in livestock AUMs. The ecological trend in the allotments used by wild horses (Antelope Draw and Seven Sisters), would not be altered by the wild horses.

Antelope would be given an 82 percent (628 AUMs) increase over the current use. This amount of forage would also be available due to the livestock decrease in AUMs. The ecological condition of the range would not be altered by the antelope.



## CHAP. 4 —RESOURCE PROTECTION ALTERNATIVE

Approximately 534 AUMs of forage would be lost through mineral developments in this locality (Appendix 15, Forage Impacts).

**Book Cliffs Locality:** Authorization of 15,412 AUMs for livestock, an unknown portion of 37,113 AUMs for deer, and an unknown portion of 14,681 AUMs for elk would improve ecological condition on five allotments (Atchee Ridge AMP, Horse Point AMP, McClelland, Sweetwater AMP, and Winter Ridge AMP). Two allotments (Book Cliffs Pasture and West Water Point) would remain in static condition (Appendix 14, Anticipated Trend in Ecological Conditions). Approximately 269,900 acres would show improving ecological trend and 34,200 acres (13 percent) would show a static condition. No declines in overall ecological condition would occur in this locality. The net improvement to ecological condition class would be a change of 5 to 10 percent, from fair to good (Appendix 16, Anticipated Change in Ecological Condition Class).

Improvements in ecological condition would result from several actions (Appendix 5, Forage Actions by Alternatives). Decreasing livestock use from 17,351 AUMs to 15,412 AUMs would result in 11 percent fewer livestock than currently use the range. The four allotments showing improvement would operate under grazing systems which would rotate grazing use to avoid the impacts of spring grazing upon plant vigor. The allotments remaining static would continue season long use.

A total of 1,317 AUMs of livestock use would be deferred from spring use in these allotments. Seven reservoirs, ten springs, and five guzzlers would be developed in the Sweetwater AMP, Winter Ridge AMP, West Water Point, Atchee Ridge AMP, and Horse Point AMP allotments, resulting in improved livestock distribution. Better forage utilization would result and grazing pressure would be reduced. Improvement of riparian areas and floodplains would result from decreasing livestock use by 18 AUMs within the Sweetwater AMP allotment.

The proposed use of 15,412 AUMs would be a 33 percent change from the original livestock forage allocation. Approximately 5,823 AUMs nonuse has been taken in this locality so the actual decrease realized on-the-ground would have significant impacts upon the permittee's livestock operations. Refer to the socioeconomic section of this alternative.

Wildlife would benefit from a 751 AUM livestock decrease on McCook Ridge (included in the overall livestock decrease). This would provide more forage for wildlife and eliminate possible competition for forage between livestock and wildlife. It would also avoid the impacts to plant vigor that would result from heavy grazing in areas of competition.

Wild horses would be removed from this locality. The forage that they consume (108 AUMs) would be available for both livestock and wildlife, because the use by wild horses was never allocated.

Approximately 306 AUMs for livestock and 297 AUMs for wildlife would be lost due to mineral developments (Appendix 15, Forage Impacts). These losses would be offset by the proposed land treatments which would produce 483 AUMs for livestock and 1,225 AUMs for wildlife.

Control burning 15,000 acres in the Atchee Ridge AMP, Horse Point AMP, Sweetwater AMP, and Winter Ridge AMP allotments, would eliminate or decrease decadent and overmature shrubs with grasses and younger, more palatable shrubs. Within one to two years after burning, the amount of forage would be increased up to 250 percent.

Clearcutting woodlands in the Sweetwater AMP and the Horse Point AMP allotments would open the woodland canopy and enable grasses, forbs, and shrubs to increase in density and vigor. The forage response would be similar to areas that would be burned.

**Hill Creek Locality:** Authorization of 5,045 AUMs for livestock, 2,340 AUMs for wild horses, an unknown portion of 37,113 AUMs for deer, and an unknown portion of 14,681 AUMs for elk, would improve ecological condition in all 12 allotments within this locality (Appendix 14, Anticipated Trend in Ecological Condition). Approximately 112,600 acres would improve in ecological condition, 27,300 acres would remain in static condition, and no acreage would decline in condition. The net improvement in ecological condition class would be a change of less than five percent from fair to good (Appendix 16, Anticipated Change in Ecological Condition Class).

Improvements in ecological condition would result from several actions (Appendix 5, Forage Actions by Alternatives). Deferment of grazing during the critical spring growth period would be required on eight allotments, for a decrease of 839 AUMs. Formal allocation of use to provide for wild horses would be made on eight allotments (Lower Showalter, Oil Shale, Pack Mountain-Wild Horse, Tabyago, Upper Showalter, Ute, and West Tabyago). A total of 2,340 AUMs would be taken from livestock nonuse to support wild horses. Grazing use (521 AUMs) would be retired on two allotments (Birchell and Green River AMP) to protect key floodplain and riparian areas. An adjustment of approximately 3,849 AUMs on nine allotments would be taken to reduce the impact of historic heavy grazing in livestock concentration areas (areas adjacent to water, trail areas, bedgrounds, etc.). Refer to Appendix 5 (Forage Actions by Alternative).

No use has been made on the Oil Shale allotment; however, if the permittee applied for use, up to 50 percent of active preference (549 AUMs) would be allowable. It is assumed this would continue, hence these AUMs are omitted from the total AUMs available for the locale.

Total impact to livestock use would amount to a decrease of 1,397 AUMs from average use (22 percent) and 7,586 AUMs below active preference. This level of livestock use would result in a significant economic impact upon the permittees. Refer to the socioeconomic section of this alternative.



## CHAP. 4 —RESOURCE PROTECTION ALTERNATIVE

Development of three reservoirs on two allotments (Pack Mountain-Wild Horse and Tabyago) would improve livestock and wild horse distribution by reducing heavy grazing use and increasing ecological condition.

Minerals developments would eliminate 37 AUMs of forage (Appendix 15, Forage Impacts). This loss would be absorbed by nonuse.

BLM actions would result in improvement in ecological condition in 49 allotments and a static condition in five allotments. No declines in ecological condition would occur on an allotment basis. Approximately 1,086,600 acres would improve, and 168,600 acres would remain in static ecological condition.

### WILDLIFE/WILD HORSES

#### BLM Impacts

The utilization of 55,597 AUMs of existing forage from BLM lands by big game species, an additional 1,325 AUMs from Dinosaur National Monument, and 2,940 AUMs by wild horses, would be sufficient to support prior-stable wildlife numbers in deer herd unit 28A, elk herd unit 21, and near prior, stable numbers in deer herd unit 26 and increased wild horse populations. This level of forage utilization would meet or nearly meet (depending upon locality) the projected requirement of the UDWR big game population goals. The allocation level would also meet the forage requirement necessary to support the increased Vernal District wild horse population objectives at the Bonanza and Hill Creek locations. Due to small herd size and low reproductive success, the Winter Ridge wild horse herd would cease to exist.

The distribution of the various wildlife species would be: 1,114 antelope (700 at Bonanza-herd unit 7, 414 at East Bench); 19,800 mule deer (1,800 at Blue Mountain-herd unit 26, 18,000 at Book Cliffs-herd unit 28A); 2,300 elk (all located at Book Cliffs-herd unit 21); 245 wild horses (50 at Bonanza, 195 at Hill Creek).

Projected oil and gas development would have the same effect as previously described under the Current Management Alternative.

Oil shale, tar sand, sand and gravel, and gilsonite development would not significantly affect big game or wild horse populations or crucial habitat. Any such mineral development would occur outside the identified crucial habitat areas.

Wildlife habitat would improve as a result of reduced livestock grazing in certain key areas, such as the McCook Ridge winter area (deer herd 28A and elk herd 21) and all of the Blue Mountain summer area (deer herd 26).

Annual depletion of 28,000 acre-feet of water from the White River could jeopardize the continued existence of two endangered fish species, the Colorado squawfish and humpback chub, and one species which is a candidate for listing, the razorback sucker. No impacts to the species

would occur if the water were purchased from the White River Dam Project (WRDP) because of agreed upon conservation measures in the biological opinion for that project (FWS 1982). However, the White River Dam Project could not supply water for all projects proposed in the UBS Development EIS and this additional oil shale development. If the water is not purchased from WRDP, the determination of the degree of impact would be determined in the Fish and Wildlife Service's Biological Opinion.

### WOODLANDS

#### BLM Impacts

By 1995, demand resulting from BLM projects would be approximately 900 cords per year.

Restrictions imposed upon woodland management by other resource programs would limit the allowable cut to 3,470 cords per year, produced from 32,700 acres of woodland. About 11,600 acres would be eliminated from woodland management to protect severe and critical erosion areas. Two hundred acres would be lost to rights-of-way placed in utility corridors, 1,400 acres used for tar sand development, 100 acres lost to wildfires (over a ten-year period), and 1,200 acres would be set aside to protect crucial wildlife habitat on Lower McCook Ridge. In total, 14,500 acres of woodlands, capable of contributing 1,350 cords of firewood to the annual allowable cut, would not be available for harvest by wood cutters.

### RECREATION

#### BLM Impacts

By 1995, and as a result of BLM projects, big game hunting opportunities would increase by 4,050 visitor days. The demand for all other recreation activities would increase visitor days by 2,700. However, approximately 575 visitor days would be foregone as a result of proposed ORV closures and restrictions.

There would be no effect on recreation by discontinuing protection of two campsites because these sites have received almost no visitor use, future development potential is extremely low, and alternate dispersed camping sites would be available.

To be consistent with the Uintah and Ouray Indian Reservation's land use plan, 14,500 acres of land in the Hill Creek area contiguous to the Reservation boundary, would be closed to ORV travel. Decreased grazing on spring ranges and elimination of grazing in riparian zones, would enhance visual resources of the landscape and reduce conflict between livestock and recreationists along the White and Green Rivers.

Proposed utility and transportation corridors would cross 1,800 acres or four percent of the visual resource management Class II area and 2,840 acres or four percent of Class III land. Certain types of rights-of-way placed in the corridors would not comply with the visual standards of these classes.



## CHAP. 4 —RESOURCE PROTECTION ALTERNATIVE

Impacts to the visual resource would be minimized by consolidating the land disturbing activities to designated corridors. This would prevent the proliferation of construction scars and man-made intrusions from randomly crisscrossing the landscape.

The oil shale priority use areas contain four percent of visual resource Class II land, where development would degrade visual resources by creating contrasts with the natural landscape. The remainder of the area, 96 percent, contains only Class IV where impacts would be minimal as surface disturbance would be noticeable, but more acceptable in areas with low scenic qualities. All areas where tar sand development would be allowed contain only Class IV areas and again where development occurs, changes to the natural landscape may attract attention.

The effects of retaining the Book Cliffs Mountain Browse Natural Area would be the same as described for the Current Management Alternative.

### FIRE MANAGEMENT

#### BLM Impacts

Full suppression of wildfire would protect approximately 84,500 acres throughout the BCRA, safeguarding private property, and preventing the spread of wildfire to non-Federal lands.

Over the next ten years, approximately 15,000 acres would be prescribed burned, providing additional wildlife habitat and forage. Under this alternative, prescribed burns would not be utilized to enhance livestock forage. The burn projects would include mature sagebrush, canyon bottoms, mature browse stands, old chainings and burns that were becoming overgrown. Prescribed burns would set back the ecological condition to earlier successional stages. Natural regeneration, mechanical reseeding, and/or tubeling transplants would improve forage quality and provide additional areas of habitat for wildlife species. "Edge effect" would be greatly improved in all these projects.

Where control would be difficult or where other resource values are not at risk of being damaged, a program of modified wildfire suppression would be utilized on 980,500 acres. At the discretion of the Resource Area Manager, wildfires could be allowed to burn until self extinguished, or until significant resource values are jeopardized. Using modified suppression, a much larger acreage could be allowed to burn, increasing the beneficial effects that fire would have on vegetation, thereby providing additional forage and habitat for wildlife. When fire conditions would cause damage to desirable resource values, and to minimize the adverse impacts of wildfire, suppression could then be used.

### WATERSHED

#### Water Use

##### BLM Impacts

Development of two additional oil shale tracts would annually require approximately 28,000 acre-feet of water for underground mining (Table 4-12, Water Requirements for Energy Development). This amounts to six percent of the average annual flow of the White River. Less water would be required if modified in situ techniques are employed. If the water cannot be purchased from other water users with valid rights, development could be delayed or prevented since the White River is essentially closed to further appropriation.

#### Water Quality

##### BLM Impacts

Prohibiting surface occupancy within public water reserves and within 600 feet of perennial streams would adequately protect water quality of these water sources. Closed and limited ORV travel designations and restrictions of mineral development in severe and critical erosion areas, would result in slight, unquantifiable improvements in water quality.

The Detailed Development Plan for the White River Shale Project assumes no wastewater discharge from tracts U-a and U-b and, therefore, no impacts to water quality (Bechtel Petroleum, Inc. 1981). Using the same assumption for any additional oil shale leases also leads to the conclusion of no impact to water quality. However, the wastewater would contain high concentrations of ammonia, sulfide, phenols, oil and dissolved solids, and has the potential to pollute both groundwater and surface water if any seepage or accidental discharge occurs. Based on depletion information in the UBS Development EIS, diverting 28,000 acre-feet per year from the White River would increase total dissolved solids concentration at the mouth of the White River by 2.6 mg/l and by 1 mg/l at Imperial Dam. This increase is less than one percent.

### Soils

#### BLM Impacts

Surface disturbance of 1,400 to 2,200 acres for tar sand recovery, 800 acres for oil shale mining, 1,200 to 3,800 acres for oil and gas production would increase soil erosion. Sediment yields from reclaimed surface mines were 300 to 600 percent higher than for undisturbed sites (Lusby and Toy 1976). In the Piceance Basin of Colorado, increases in sediment yield of 5.8 to 11.6 tons per acre per year during initial construction of oil shale mining sites and 2.9 tons per acre per year after construction were reported (Frickel, et



## CHAP. 4 —RESOURCE PROTECTION ALTERNATIVE

Table 4-12  
Water Requirements for Energy Development  
(acre-feet/year)

Project	Maximum White River Development	Maximum Green River Development	Total Water Use Regardless of Source <sup>a</sup>
Total of 8 Uintah Basin Synfuels Projects	<u>37,000</u>	<u>32,000</u>	<u>42,000</u>
Related Development			
a. Bonanza Power Plant	-	22,000	22,000
b. White River Shale (Tracts Ua & Ub)	28,000	28,000	28,000
c. Municipal/Industrial <sup>b</sup>	20,000	20,000	20,000
d. Agriculture <sup>c</sup>	20,000	20,000	20,000
Subtotal	<u>68,000</u>	<u>90,000</u>	<u>90,000</u>
Baseline without additional oil shale development	<u>105,000</u>	<u>122,000</u>	<u>132,000</u>
Two oil shale tracts (Resource Protection)	28,000	28,000	28,000
TOTAL	133,000	150,000	160,000
Four oil shale tracts (Commodity Production)	56,000	56,000	56,000
TOTAL	161,000	178,000	188,000
Two to four oil shale tracts (Balanced Use)	28,000-56,000	28,000-56,000	28,000-56,000
TOTAL	133,000-161,000	150,000-178,000	160,000-180,000

Uintah Basin Synfuels Development EIS

<sup>a</sup>Figures do not total horizontally because the White River and Green River are alternative sources for several of the projects.

<sup>b</sup>Estimated increases of water use from projected population increases and from other industrial increases.

<sup>c</sup>Estimated requirement based upon agricultural trends.



## CHAP. 4 —RESOURCE PROTECTION ALTERNATIVE

al. 1975). Assuming a tripling of soil loss from disturbed sites in the BCRA, soil loss in the next 10 years would be an additional 9,900 to 19,700 tons.

Closed and limited ORV travel designations and restrictions on mineral development in severe and critical erosion areas would reduce soil loss by an unquantifiable amount. Although this additional soil loss would be less than one percent of the current soil loss from the entire BCRA, localized impacts could be severe in gully formations and areas with reduced vegetation cover.

Confining major rights-of-way to 23.8 miles of corridors totalling 9,000 acres in severe and critical erosion condition, would result in fewer acres disturbed and decreased soil erosion.

Constructing up to 5,555 detention-retention dams on 111,100 acres in severe and critical erosion condition, would reduce soil loss by 711,000 tons over the next 10 years. The short-term increase in wind and water erosion resulting from dam construction would be insignificant.

No other BLM actions would significantly affect soils.

### Floodplains

#### BLM Impacts

Limiting or restricting livestock from 5,950 acres, closing 14,200 acres to ORV use, and allowing no surface occupancy for mineral development in floodplains, would result in an unquantifiable improvement in floodplain condition.

### Boulevard Ridge Study Area

#### BLM Impacts

Impacts resulting from BLM actions are the same as discussed under the Current Management Alternative.

## LAND TENURE ADJUSTMENT

#### BLM Impacts

Up to 5,660 acres could be acquired by BLM, if they become available (Figure 2-14). The identified lands are important riparian and wildlife habitat; their acquisition would enhance the management of wildlife habitat in the BCRA. Site specific environmental analyses would be done prior to acquisition.

## AIR QUALITY

#### BLM Impacts

Impacts to air quality of a new Federal oil shale lease producing 80,000 bpd were assumed to be similar to those previously analyzed for (Dietrich, et al. 1983). The location

and assumed technology were similar. No NAAQS, or PSD, or Colorado Category I increment violations from new Federal leasing alone, would be expected.

The visibility analysis indicated no discernible visibility degradation at Dinosaur National Monument. Yellow-brown atmospheric discoloration could occasionally be visible near the new lease developments.

Tar sand development of 5,000 to 10,000 bpd would cause little impact to air quality or visibility, except for potential local exceedances of the Class II TSP increments near surface mines and unpaved roads (Aerocomp, 1984).

## SOCIOECONOMICS

Methodologies and computations that were used to estimate economic impacts are discussed in Appendix 12 (Methodology for the Economic and Social Analysis).

### Economic Conditions

#### BLM Impacts

The effect of implementing the Resource Protection Alternative on oil and gas development would be expected to be similar to that discussed for the Current Management Alternative. Employment and personal income opportunities for local residents would remain essentially the same, with only minor variations.

Production from oil shale and tar sand leasing would change local employment, population, infrastructure, and fiscal conditions. The production scenario, labor force requirements, settlement patterns, and impact analyzes from oil shale developments, are modeled after the "UBS Socioeconomics Technical Report" except, that construction would not be expected to begin until 1987. Full production would be reached by 1995 (Utah E.O. 1983). Similarly, the production scenario, labor force requirements, settlement patterns, and impact analysis from tar sand developments is modeled after the "Regional Analysis of Tar Sand Developments in Utah Socioeconomic Technical Report" (BLM 1983h).

By the year 1995, assumed production and timing with implementation of this alternative, would increase the regional population by 16,814 people. None of the counties or communities would accommodate a greater than 10 percent annual growth rate. Including baseline population projections, Uintah County and the communities and surrounding areas of Vernal and Rangely, would at some time, experience a greater than five percent annual growth rate. The BCRA would also experience a greater than five percent annual growth rate. The population increase would come in the form of work camps temporarily housing some of the construction work force. If a smaller proportion of the construction work force were to stay in the work camps, then the surrounding communities would experience a greater population peak while long-term population projections would remain unchanged.



## CHAP. 4 —RESOURCE PROTECTION ALTERNATIVE

Both the Uinta Basin Synfuel EIS and the Utah Combined Hydrocarbon Leasing Regional EIS have assumed that tar sand development in the PR Spring STSA would result in a new community being established in the Westwater area. A new community would reduce social and economic impacts that other nearby communities would realize if the Westwater community was not developed. Whether or not a new community would actually be established, is uncertain.

Oil shale and tar sand developments would directly increase regional employment and income earned in the mining and construction sectors. The induced and indirect effects of oil shale and tar sand activities would increase employment and income in other sectors as well, particularly the retail and service sectors. The increased relative importance of the high-paying mining and construction sectors and the increased demand for workers in other sectors would increase the regions per capita income by an unknown amount.

In areas where mineral resources overlap (e.g. oil shale, gilsonite, tar sand, oil and gas) only one resource could be developed at a time. In certain cases, the remaining mineral resources could not be developed at all. Therefore, unquantified employment and personal income opportunities associated with development of these other resources would be delayed, or not realized at all. These unquantified losses would be insignificant.

Gilsonite, mining, and miscellaneous mineral activities would continue essentially unchanged from that discussed in the Current Management Alternative.

Under this alternative, sand, gravel and building stone collection would not be allowed in the BCRA. Employment and personal income loss would be minor as other areas outside the BCRA could accommodate the projected demand.

Not allowing gravel or building stone collection in the BCRA would force those who would have used the BCRA (currently 25 to 50 people/year) to travel up to 50 additional miles round trip to obtain these materials. The lack of commercial activity in the area suggests that no company, employment, or income would be significantly affected.

The actions proposed by BLM would produce increased demands on infrastructure within the region. Table 3-6 projects the needs through the year 2000. These needs can be estimated for each community by comparing the projected population increases of that community (Table 4-13) with the projected population increases of the region (Table 4-14) and applying the resulting proportion to the projected infrastructure needs of the region (Table 3-6).

Compared to their existing use, 20 cattle operators would have 16 percent less available BCRA forage, resulting in an average \$25,214 decrease in returns above cash costs, three percent less than what they presently earn.

Compared to their existing use, 18 sheep operators would have 19 percent less available forage, resulting in a \$138,564 decrease in returns above cash costs, 7 percent less than what these operators presently earn.

The spring (March through May) exclusions of livestock would be of particular concern to livestock operators, since they have few options with which to respond to these exclusions. Most operators would have to either purchase feed to replace the lost forage, shift forage that is normally used in other months to this period, or reduce their herd size so that the forage produced from their base property would last longer. The spring exclusions would force sheep operators who had been lambing on public land, to lamb on their base property.

Replacing forage lost through spring exclusions with hay would represent a worst-case analysis. Feeding hay during the spring may adversely affect livestock weight gains and reduce gross revenues. If the feeding were to be done on alfalfa-producing property during the spring, alfalfa yields could be affected, and bloating problems could arise. However, reducing the herd size would usually be a more economical response to spring exclusions than purchasing hay (Godfrey 1981).

Under this alternative, 20 of the 21 cattle operators would be excluded from using forage during the spring, thereby losing the spring use of approximately 3,457 AUMs. The cost of replacing this forage with alfalfa produced at \$60 per ton would be \$207,420. All eighteen of the sheep operators would receive significant spring exclusions, thereby losing the use of approximately 6,352 AUMs during the spring. The cost of replacing this forage with alfalfa at \$60 per ton would be \$381,120. The number of livestock operators affected to varying degrees estimated worst-case impacts are shown in Table 4-15 and 4-16, respectively.

Because there are other options an operator could choose other than a reduction in AUMs of use on public lands, this option was not considered in estimating economic impacts.

Total impacts would not change if the proposed mineral developments were concentrated in several allotments rather than spread among all allotments with mineral development potential, as was assumed in the analysis. With concentrated mineral developments, several operators would be affected to a slightly greater extent than shown in Table 4-15.

Any decrease from active preference could affect operators wealth. Under this alternative, total long-term grazing privileges would be decreased by 49,592 AUMs from active preference. At a market value of \$60 per AUM for BLM grazing permits, total operator wealth could decline by as much as \$2,972,520, a 10 percent base property value reduction.

Because total rancher income is expected to decrease under this alternative, the rancher's ability to repay loans should also decrease.

Projected population increases as the result of potential oil shale and tar sand development would result in increases in recreational activities and activity days. These BLM actions would result in an increase of 2,700 recreation days



Table 4-13

Population Projections  
for  
Resource Protection Alternative

Area	1982			1985			1990			1995			2000			
	Base	Base	BLM	Other	Base	BLM	Other	Base	BLM	Other	Base	BLM	Other	Base	BLM	Other
Duchesne	15,273	17,778	0	4,965	18,632	1,179	10,226	18,684	1,900	13,082	18,929	1,900	15,723			
Roosevelt CCD	11,827	13,695	0	348	15,057	1,169	3,019	15,005	1,881	3,122	14,636	1,881	3,799			
Roosevelt	4,678	5,416	0	244	5,955	814	2,057	5,934	1,311	2,106	5,789	1,311	2,599			
Myton	609	705	0	12	775	35	103	773	57	105	754	57	130			
Other	6,540	7,514	0	92	8,327	318	859	8,298	513	911	8,093	513	1,070			
Other	3,446	10,204	0	4,617	3,575	12	7,207	3,679	19	9,960	4,293	19	11,924			
																</

CCD: Census County Division



## CHAP. 4 —RESOURCE PROTECTION ALTERNATIVE

TABLE 4-14

Resource Protection Alternative  
Summary of Regional Socioeconomic Impacts  
Resulting from BLM Actions

Socioeconomic Development Category	Change From Projected Baseline			
	1985	1990	1995	2000
Population Growth				
Total	-	9,830	16,814	16,126
School Age	-	2,024	4,162	4,611
Employment Growth	-	4,983	7,807	6,556
Household Growth	-	3,411	5,412	4,414
Infrastructure Requirement				
Housing				
Single family	-	2,050	3,239	2,650
Multi-family	-	517	813	667
Mobile homes	-	857	1,353	1,107
Education				
Students	-	2,024	4,162	4,611
Classrooms	-	86	170	188
Teachers	-	86	170	188
Health Care				
Hospital beds				
General care	-	25	39	35
Long-term care	-	12	19	24
Medical personnel				
Doctors	-	12	16	14
Dentists	-	12	14	13
Nurses	-	21	32	31
Public health nurses	-	9	10	9
Medical health care				
Clinical psychologists	-	9	9	8
Mental health workers	-	9	9	8
Public Safety				
Law Enforcement				
Police officers	-	12	19	35
Patrol cars	-	12	19	35
Jail space (sq. ft.)	-	4,850	8,418	7,942
Juvenile holding cells	-	9	9	9
Fire Protection				
Fire flow (gpm)/ duration (hr) <sup>a</sup>				
Emergency Medical Services				
Ambulances	-	9	10	9
Emergency medical technicians	-	65	70	61



## CHAP. 4 —RESOURCE PROTECTION ALTERNATIVE

TABLE 4-14 (Continued)

Resource Protection Alternative  
Summary of Regional Socioeconomic Impacts  
Resulting from BLM Actions

Socioeconomic Development Category	Change From Projected Baseline			
	1985	1990	1995	2000
Utility Service Demands				
Water System				
Connections	-	3,130	5,436	5,127
Supply (10 <sup>6</sup> gal/yr.)	-	1,828	3,174	2,994
Storage (10 <sup>6</sup> gal/yr.)	-	917	1,588	1,498
Treatment (10 <sup>6</sup> gal/yr.)	-	1,828	3,174	2,994
Sewage System (10 <sup>6</sup> gal/yr.) <sup>a</sup>	-	352	614	580
Solid Waste <sup>b</sup>				

Source: BLM 1983h.

<sup>a</sup>Fire protection measured in fire flow (gpm)/duration (hr) cannot be aggregated across the affected counties.

<sup>b</sup>The State of Utah community facility guidelines do not include a solid waste standard. Therefore, an estimate of solid waste disposal impacts could not be determined.



## CHAP. 4 —RESOURCE PROTECTION ALTERNATIVE

TABLE 4-15

Number of Operators Affected Under the Proposed  
Plan and Degree of Impact

	Percent Increase From Existing Use and Revenues			Not Affected	Percent Decrease From Existing Use and Revenues		
	50-100	11-50	1-10		1-10	11-50	51-100
Public Rangeland Forage					8	31	
Operator Returns Above Cash Cost					28	10	1

Note: Changes are based on average use over the past 3 years.

TABLE 4-16

Summary of Short-Term and Long-Term Economic Impacts  
to Livestock Operators in Dollars

	Current Situation	Average Resource Protection Case	Worst Resource Protection Case
<u>Cattle Operators</u>			
Gross Revenue	\$2,415,282	\$2,397,835	
Total Cash Cost	1,441,458	1,449,225	
Returns Above Cash Cost	973,824	948,610	\$906,224
Returns to Labor and Investment	526,204	503,541	459,591
<u>Sheep Operators</u>			
Gross Revenue	\$3,585,258	\$3,452,004	
Total Cash Cost	1,509,804	1,515,114	
Returns Above Cash Cost	2,075,454	1,936,890	\$1,925,653
Returns to Labor and Investment	1,719,522	1,582,344	1,569,926



## CHAP. 4 —RESOURCE PROTECTION ALTERNATIVE

and an increase in revenue to the local economy of \$121,500. This increase would be 37 percent higher than present BCRA levels.

BLM wildlife management actions would result in increased long-term big game populations and would result in more hunter days; thus, an increase in expenditures, income, and employment. With this large increase in wildlife numbers, hunters may be attracted to the BCRA from more areas outside of the county. More hunters from Salt Lake City and Denver may decide to hunt in the resource area. It could mean an increase of up to 4,060 hunter days and an increase in revenue to the local economy of \$182,700. The increase would have significant long-term beneficial impacts to the recreation sector since they represent a 60 percent increase in BCRA recreation generated revenues.

### Social Conditions

The region's traditional farming and ranching communities would continue to lose their cultural identity. Political, social, and economic diversity would continue to increase.

Short-term social impacts to existing communities would be significantly reduced by the construction of work camps and a new community in Grand County. However, the worker composition and probable work camp conditions would lead to an undesirable quality of life for those living in the work camps. The new sterile community would eventually become more like surrounding communities.

Social impacts to native-Americans would depend on the degree that they would benefit from the increased economic opportunities. Based on past experience, the existing disparity between Indian and non-Indian income and living conditions would not change. Indian out migration would continue. The projected influx of newcomers unfamiliar with American Indians could further increase trespass and poaching problems. Also, tribal customs and rituals may fade as Indians become further assimilated with the increasingly diverse population around them.

### TRANSPORTATION

#### BLM Impacts

By 1995, BLM actions would result in increased traffic volumes on the four major highways in the area. The affected highways and the estimated average daily traffic increases are shown in Table 4-18. Highway levels of service would not change. A slight, unquantifiable increase in traffic accidents would be expected to occur.

### UNAVOIDABLE ADVERSE IMPACTS

Development of mineral resources such as oil and gas, tar sand, and oil shale would result in surface disturbance and modification of topography.

Forage utilized by wildlife, livestock, and wild horses would be lost as a result of various mineral and mineral-related developments. If this alternative is selected, livestock AUMs would decrease partially due to increasing wildlife numbers.

Wildlife and wild horses displaced by mineral development into surrounding areas of suitable habitat could be subject to crowding, stress, and competition for forage, water, and cover. In addition, an unquantifiable amount of habitat surrounding each oil and gas well would be abandoned by most wildlife species. However, restrictions on mineral development in deer and elk fawning and calving areas would lessen these impacts.

The White River could be depleted of 28,000 acre-feet of water per year for additional energy development. Salinity would increase at the mouth of the White River by 2.6 mg/l and at Imperial Dam by 1 mg/l.

Approximately 9,900 to 19,700 tons of soil would be lost as a result of surface-disturbing activities related to mineral development.

TSP concentrations would increase with a greater probability of exceeding PSD Class II limits. Atmospheric discoloration may occasionally be visible near synthetic fuel facilities and power plants, at Dinosaur National Monument, and the Uintah and Ouray Indian Reservation.

Overhead powerlines and communication lines within the designated utility and transportation corridors may not comply with visual resource management Class II and Class III areas.

### IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Based on present technology, minerals mined and subsequently consumed, or left underground as unrecoverable, would be irretrievably lost.

Tar sand strip mining could permanently alter the site potential to produce forage on approximately 840 acres. The changes would be irreversible.

Soil would be irretrievably lost as a result of surface-disturbing activities.

Some degradation of air quality would be irreversible, due to established urbanization in the area after closure of the oil shale and tar sand facilities.

### SHORT-TERM USE VERSUS LONG-TERM PRODUCTIVITY

Because of the number and amount of minerals considered unrecoverable with present mining technology and practices, loss of mineral production could occur in the long term to achieve short-term minerals production.



## CHAP. 4 —RESOURCE PROTECTION ALTERNATIVE

Table 4-18

Projected Average Daily Traffic Levels  
Caused By BLM Generated Impacts, By Alternative,  
By Year 1995

Highway Segment	Resource Protection	1995 Commodity Production	Balanced Use
<u>Utah 88</u>			
From Ouray to U.S. 40	812	1,556	1,285
<u>U.S. 40</u>			
From Utah 88 to Vernal	1,618	3,102	2,562
From Vernal to Jensen	1,469	2,815	2,325
From Jensen to County 262	654	1,253	1,035
From County 262 to Colo. Line	634	1,215	1,004
<u>County 262</u>			
From Utah 45 to U.S. 40	95	182	150
<u>Utah 45</u>			
From Vernal to County 262	411	787	650



## CHAP. 4 —RESOURCE PROTECTION ALTERNATIVE

In areas where grazing has resulted in poor ecological condition, the loss of topsoil or source of seed for perennial plants, would reduce the long-term productivity of the range.

Use of prescribed burning techniques would result in a short-term loss of forage in the treated area of from one to three years. The long-term productivity of the area can be increased by up to three times the annual production rate. Chemical treatments and clear cutting would have similar short-term losses for long-term forage gains. A total of 16,000 acres would be treated using these methods, resulting in an additional 1,700 AUMs of forage.

The harvesting of firewood would increase the long-term production of forage for wildlife and livestock.

Decreasing livestock use by 13,607 AUMS and deferring spring grazing in the short term would result in a long-term improvement in ecological condition in riparian areas, floodplains, and the overall range. Forage removed for mineral production sites and facilities along with oil and gas pads and roads would be considered a long-term forage loss. Forage, removed in areas with less than 10 inches of rainfall, would be considered a long-term loss (up to 30 years) unless special mitigation is employed, such as fencing and watering. Although a short-term loss of forage occurs from strip mining, in situ development, and oil and gas wells that do not go into production, a long-term forage production can be maintained or improved with adequate rainfall and proper reclamation techniques.

Although a short-term forage and habitat loss would result from forage and habitat improvement projects, a long-term forage and habitat benefit would result. The short-term effects of livestock project construction, timber harvest, and energy development would be the abandonment of habitats by wildlife during the developmental and operational phases. It would be expected that wildlife would return to these areas following a period of successful reclamation. In mineral-developed areas with limited rainfall or poor quality soils, reclamation of wildlife habitat could take up to 30 years resulting in a long-term loss of habitat. This period of time could be lessened to a short-term impact with proper reclamation techniques. A short-term impact to wildlife habitat from construction of range improvement projects would enhance wildlife habitat over the long term.

The 28,000 acre-feet of water used to develop two additional oil shale tracts would be considered a long-term allocation of water (up to 30 years). This water would be available for other use upon project completion. During the long-term period of water depletion from the White River, salinity would be increased downstream. The water quality would be restored when the water was no longer needed for oil shale development.

A long-term improvement of riparian areas and floodplains would result from short-term closure of 14,200 acres to ORV use and limiting grazing on 5,950 acres.

The removal of woodlands for energy-related activities, chainings, burnings, and others, is considered a long-term loss (up to 150 years).

Wildfires occurring in pinyon/juniper stands would delay the regeneration process by destroying the seed source. Reestablishment of stands would be delayed 40 to 80 years. Depending on the size of the burn, the allowable cut could be reduced, thus, less pinyon and juniper firewood would be available for firewood cutters.

The amount of air quality degradation that would result from oil shale and tar sand developments would be a long-term commitment.

### CUMULATIVE SUMMARY

Direct cumulative impacts on minerals would generally be the same as were discussed under the BLM Impacts for this alternative. However, it should be noted that while air quality permits and water supplies would be available for additional oil shale and tar sand projects, if considered separately from interrelated projects, when considered cumulatively, air quality permits and sufficient water supplies may not be available, resulting in delays in development of Federal oil shale and tar sand resources.

Livestock forage use would be decreased by approximately 13,607 AUMs below average use. This would be an overall cut of approximately 20 percent from average use (present operating levels) and approximately 48 percent from active preference (allowable operating levels). Grazing would be eliminated on the White River Bottoms, Birchell, and Green River AMP allotments.

BLM actions would result in improvement in ecological condition in 49 allotments and a static condition in 5 allotments. No declines in ecological condition would occur on an allotment basis. Approximately 943,000 acres would improve, and 171,900 acres would remain in static ecological condition. The net improvement of ecological condition would be a change of 5 to 10 percent, from fair to good, and approximately one percent from good to excellent.

Wildlife forage use would increase by approximately 11,959 AUMs, (27 percent) above the allocated use. This would be an increase of approximately 200 percent above the average (current) use.

Wild horses would be allocated 2,940 AUMs, a change from no allocation. The change would be a 19 percent increase over average (current) use.

An estimated 1,181 AUMs would be lost due to mineral development activities; however, the land treatments would add an estimated 1,708 AUMs of forage.

Cumulative depletions of the White River would increase by 195,000 acre-feet per year or 42 percent of the average annual flow. This would exceed the capacity of the White River reservoir by 86,000 acre-feet.

The cumulative increase in total dissolved solids concentration at Imperial Dam resulting from interrelated projects and BLM actions, would be 6 mg/l. The amount is less than a one percent increase.



## CHAP. 4 —RESOURCE PROTECTION ALTERNATIVE

Cumulative impacts to the watershed study area and floodplains are the same as discussed for BLM actions under the Current Management Alternative.

The cumulative demand for firewood could reach 7,400 cords per year by 1995. Firewood demand would annually exceed the allowable cut by 3,930 cords. The BLM would not be able to supply firewood for slightly over half of the people seeking wood permits.

With increasing population in the Uintah Basin, as well as numbers of big game, hunting opportunities could expand from 6,770 visitor days in 1982 to 17,570 or an increase of 10,800 visitor days by 1995. The quality of hunting would remain the same, as the increase of big game numbers would be nearly the same proportion as the increase of hunter visitor days. Demand for all other forms of recreation, except big game hunting, would expand from the current level of 7,200 to 21,860 visitor days, an increase of 14,660. Sufficient undeveloped areas would be available to accommodate the increase in dispersed outdoor recreation activities such as sightseeing, camping, and river floating. Other activities requiring developed facilities, would be available on adjacent State and U.S. Forest Service lands.

Cumulative impacts to air quality would likely exceed Class II TSP standards at some areas, including Dinosaur National Monument; the Uintah and Ouray Indian Reservation; Vernal, Utah; and Rangely, Colorado. Yellow-brown atmospheric discoloration resulting from emissions of nitrogen oxides from synthetic fuel facilities and power plants would likely be visible on the Uintah and Ouray Indian Reservation, at Dinosaur National Monument, and near power plants and synthetic fuel facilities.

Cumulative impacts on infrastructure needs for the Resource Protection Alternative are summarized in Table 4-17. Population projections for Uintah and Duchesne Counties and the communities of Ballard, Vernal, and Dinosaur, show a need to accommodate a greater than 10 percent annual growth rate. Roosevelt, Myton, and Rangely would need to accommodate a greater than five percent annual growth rate.

The cumulative transportation impacts of the baseline, interrelated projects, and BLM actions, are displayed on Table 4-19. All highways except County Road 262 would provide an unsatisfactory level of service resulting in traffic congestion, accident rate increase, and road deterioration.



# CHAP. 4 — RESOURCE PROTECTION ALTERNATIVE

TABLE 4-17

Resource Protection Alternative  
Cumulative Infrastructure Needs  
BLM and Interrelated Projects

Socioeconomic Development Category	1985	1990	1995	2000
Population Growth				
Total	27,282	59,098	79,804	91,103
School Age	4,619	11,296	20,207	35,217
Employment Growth	15,817	30,591	36,010	38,609
Household Growth	8,264	18,593	23,782	25,575
Infrastructure Requirement				
Housing				
Single family	4,958	11,158	14,261	15,347
Multi-family	1,239	2,794	3,569	3,842
Mobile homes	2,066	857	5,946	6,398
Education				
Students	4,619	11,296	20,207	27,776
Classrooms	185	456	811	1,115
Teachers	185	456	811	1,115
Health Care				
Hospital beds				
General care	59	84	136	185
Long-term care	12	42	69	81
Medical personnel				
Doctors	16	42	53	59
Dentists	14	36	45	51
Nurses	46	105	138	157
Public health nurses	6	19	24	25
Medical health care				
Clinical psychologists	3	13	13	13
Mental health workers	4	15	15	17
Public Safety				
Law Enforcement				
Police officers	54	110	144	185
Patrol cars	54	110	144	185
Jail space (sq. ft.)	13,592	29,526	39,645	45,297
Juvenile holding cells	5	16	18	19
Fire Protection				
Fire flow (gpm)/ duration (hr) <sup>c</sup>				
Emergency Medical Services				
Ambulances	6	19	24	25
Emergency medical technicians	38	133	165	171



## CHAP. 4 —RESOURCE PROTECTION ALTERNATIVE

TABLE 4-17 (Continued)

Resource Protection Alternative  
Cumulative Infrastructure Needs  
BLM and Interrelated Projects

Socioeconomic Development Category	1985	1990	1995	2000
Utility Service Demands				
Water System				
Connections	8,769	18,975	25,584	29,229
Supply (10 <sup>6</sup> gal/yr.)	5,121	11,082	14,941	17,069
Storage (10 <sup>6</sup> gal/yr.)	2,561	5,544	7,474	8,535
Treatment (10 <sup>6</sup> gal/yr.)	5,121	11,082	14,941	17,069
Sewage System (10 <sup>6</sup> gal/yr.)	992	2,144	2,894	3,307
Solid Waste <sup>a</sup>				

Source: BLM 1983h.

<sup>c</sup>Fire protection measured in fire flow (gpm)/duration (hr) cannot be aggregated across the affected counties.

<sup>d</sup>The State of Utah community facility guidelines do not include a solid waste standard. Therefore, an estimate of solid waste disposal impacts could not be determined.



## CHAP. 4 —RESOURCE PROTECTION ALTERNATIVE

Table 4-19

Cumulative Projected Average Daily Traffic Levels  
for Baseline, Interrelated and BLM Actions, By Alternative,  
By Year 1995

Highway Segment	Resource Protection	1995 Commodity Production	Balanced Use
<u>Utah 88</u>			
From Ouray to U.S. 40	8,075	8,819	8,548
<u>U.S. 40</u>			
From Utah 88 to Vernal	22,787	24,271	23,731
From Vernal to Jensen	22,169	23,515	23,025
From Jensen to County 262	9,841	10,440	10,222
From County 262 to Colo. Line	9,295	9,876	9,665
<u>County 262</u>			
From Utah 45 to U.S. 40	1,639	1,726	1,694
<u>Utah 45</u>			
From Vernal to County 262	NA	NA	NA

NA: Not Available



# COMMODITY PRODUCTION ALTERNATIVE

## MINERALS

### Oil and Gas

#### BLM Impacts

Total annual production and associated disturbance would remain the same as discussed for the Current Management Alternative. The conflicts between the other surface resources (reflected by the category designations) and the potential and producing oil and gas areas are summarized in Tables 4-7 and 4-8.

As discussed in the Resource Protection Alternative, the potential exists for oil and gas developments being inadvertently damaged or destroyed by oil shale construction activities.

### Oil Shale

#### BLM Impacts

Approximately 130,000 to 180,000 bpd could be produced on four future oil shale tracts located within the priority management area (Figure 2-16). Approximately 1,700 to 2,200 acres would be disturbed during the production phase. An additional 20,000 bpd could be produced on an in situ oil shale tract. Approximately 1,250 acres would be disturbed during production, due to mining and related construction activities.

### Tar Sand

#### BLM Impacts

Approximately 25,000 to 60,000 bpd could be produced on future hydrocarbon leases (Table 4-4). Approximately 13,400 to 22,700 acres would be disturbed due to mining and related construction activities (Table 4-5).

All public land within the STSAs would be available for tar sand development (Table 4-11). Tar sand within the Naval Oil Shale Reserve is withdrawn and reserved for the U.S. Navy (Figure 1-4). Special mitigating measures (category system) could have an effect on tar sand development similar to those discussed for oil and gas development which are summarized in Table 4-11.

Tar sand deposits and shallow oil shale deposits occur in the same geographical areas. Development of one of the resources would significantly delay the development of the other resource.

### Gilsonite

#### BLM Impacts

Anticipated impacts would be similar to those discussed in the Resource Protection Alternative.

### Sand and Gravel

#### BLM Impacts

Several additional areas could be made available for sand and gravel disposal. Approximately 50 to 110 acres could be disturbed annually. Sufficient sand and gravel would be made available to meet the projected demand over the next several years.

### Building Stone

#### BLM Impacts

One new area would be available for building stone collection which would cover an additional 24,500 acres. How many acres that would actually be disturbed is not known. Approximately 1,000 acres of building stone could be damaged or destroyed by development of in situ oil shale.

## RIGHT-OF-WAY CORRIDORS

#### BLM Impacts

Under this alternative, approximately 174,000 acres would be affected in the designated corridors (Figure 2-19). Major resource conflicts would include wildlife habitat, camp sites, productive woodlands, habitat for threatened and sensitive plant species, areas in critical and severe erosion condition, scenic overlooks, river corridors, visual resources, and floodplains (Appendix 9, Utility Corridors and Segments by Alternative). Site specific environmental documentation would be prepared for construction within the 330 miles of proposed corridors when specific right-of-way applications are received.

## FORAGE

#### BLM Impacts

**Blue Mountain Locality:** Authorization of 6,425 AUMs for livestock and 934 AUMs for wildlife would result in an improvement in ecological condition in four allotments: Blue Mountain AMP, Doc's Valley, Point of Pines, and Stuntz Valley. Two allotments would remain static (Cub



## CHAP. 4 —COMMODITY PRODUCTION ALTERNATIVE

Creek and Green River); no allotments would decline in overall ecological condition. Approximately 29,000 acres (76 percent) would improve in condition and 9,000 acres would remain in static condition. The net improvement to ecological condition class would be a change of about 5 percent, from fair to good and from good to excellent (Appendix 16, Anticipated Change in Ecological Condition Class).

An upward trend in ecological condition would result from land treatments, water development, and the development and revision of grazing systems. Approximately 11,625 acres would be burned or chemically treated. Doc's Valley and Blue Mountain AMP allotments would gain 582 AUMs beyond their original allocation levels; the other four allotments would have their carrying capacity returned to what it was at the time of adjudication. The total amount of forage produced in this locality would be 7,369 AUMs. Development of a total of three reservoirs, one spring, and one mile of pipeline in the Blue Mountain AMP, Green River, and Point of Pines allotments would result in better grazing distribution and improve overall plant vigor within the allotments. Grazing systems would be developed for Point of Pines, Doc's Valley, and Stuntz Valley; and the Blue Mountain AMP would be revised. Implementation of the grazing systems would defer spring grazing, resulting in an improvement in ecological condition as described in the general impact discussion of forage.

Wildlife forage would be reduced 834 AUMs (47 percent) below current use. When compared to allocated use, the reduction would be 66 AUMs or seven percent. The 66 AUMs would be available to support the increased livestock use.

Minerals developments would destroy an estimated 10 AUMs, bringing the total available forage to 7,359 AUMs.

**Bonanza-Rainbow Locality:** Authorization of 62,026 AUMs for livestock, 377 AUMs for antelope, no AUMs for wild horses, and an unknown portion of 12,784 AUMs for deer would improve ecologic condition on 14 allotments, and 15 allotments would remain static; no allotments would decline in ecologic condition (Appendix 14, Anticipated Trend in Ecological Condition). Approximately 252,400 acres (40 percent) would improve and 380,800 acres would remain in stable ecologic condition. No declines in overall range condition would occur in this locality. The net improvement to ecological condition class would be a change of about 1 percent, from fair to good (Appendix 16, Anticipated Change in Ecological Condition Class).

Improvements in ecological condition would result from several actions. A total of 15 grazing systems would be prepared or revised to defer spring grazing. A total of 48 water developments would improve livestock and wildlife distribution and forage utilization on 12 allotments. Approximately 1,000 acres of sagebrush would be burned or chemically treated in the Raven Ridge allotment to improve forage quality and quantity (68 AUMs).

Total livestock use would increase by 703 AUMs (one percent) above active preference. These increases would

occur in Asphalt Draw, Brewer, Olsen AMP, Raven Ridge, Sand Wash, Sunday School Canyon AMP, and Watson allotments. The increases would result from the land treatments or the transfer of wildlife AUMs to livestock.

Wild horses would be relocated outside of this locality under this alternative. The 480 AUMs of forage would be available for livestock use.

Antelope would be authorized 377 AUMs. This is 385 AUMs (51 percent) below the current level of use. However, it is 65 AUMs above the number of AUMs allocated to antelope at the time of forage adjudication. The additional 65 AUMs would be deducted from the forage allocated for deer.

The 2,959 AUMs allocated for deer in this locality would be reduced by 1,564 AUMs (53 percent). Mineral developments would eliminate approximately 859 AUMs (Appendix 15). Antelope would be given 65 AUMs from deer and livestock would be given 640 AUMs.

Authorized deer use in herd unit 28A which encompasses the Bonanza-Rainbow, Book Cliffs, and Hill Creek localities would be 12,784 AUMs. No attempt is made to break down this amount of forage by individual locality. It represents the amount of forage required to support current deer use, and no change to the deer population is expected.

**Book Cliffs Locality:** Authorization of 28,385 AUMs for livestock, 0 AUMs for wild horses, an unknown portion of 12,784 AUMs for deer, and an unknown portion of 3,192 AUMs for elk would result in the improvement of plant vigor and ecologic condition on four allotments and static condition on three allotments (McClelland, Book Cliffs Pasture, and West Water Point). Approximately 260,100 acres (86 percent) would improve and 44,000 acres would remain in static ecologic condition. No declines would occur in overall ecological condition in this locality. The net improvement in ecological condition class would be a change of less than 5 percent, from fair to good (Appendix 16, Anticipated Change in Ecological Condition Class).

Improvements would result from several actions (Appendix 5, Forage Actions by Alternative). Four allotments (Atchee Ridge AMP, Winter Ridge AMP, Horse Point AMP, and Sweetwater AMP) would operate under revised grazing systems that would rotate grazing use to avoid the impacts of spring grazing upon plant vigor. Approximately 14,500 acres would be improved through land treatments resulting in an additional 1,800 AUMs of forage.

Total livestock use would increase to 28,385 AUMs, a 24 percent increase above active preference. All seven livestock allotments would operate at full preference. Approximately 5,014 AUMs of wildlife forage would be given to livestock to attain full preference. The Winter Ridge wild horse herd would be relocated outside this locality under this alternative. The 108 AUMs of forage would be available for livestock use.

Authorized deer use would not change from current use as previously discussed in the Bonanza-Rainbow locality.



## CHAP. 4 —COMMODITY PRODUCTION ALTERNATIVE

Authorized elk use in herd unit 21 which encompasses the Book Cliffs and Hill Creek localities would be 3,192 AUMs. No attempt is made to break down this amount of forage by individual locality. It represents the amount of forage required to support current elk use, and no change to the elk population is expected.

Mineral development would result in a loss of 2,949 AUMs (Appendix 15, Forage Impacts).

**Hill Creek Locality:** Authorization of 12,649 AUMs for livestock, 710 AUMs for wild horses, an unknown portion of 12,784 AUMs for deer, and an unknown portion of 3,192 AUMs for elk would result in improvement in ecological condition in eight allotments and static condition in four allotments (Green River AMP, Bartholomew, Santio Sibello, and Thorne-Ute-Broome) (Appendix 14, Anticipated Trend in Ecological Condition). Approximately 100,900 acres would improve, 39,100 acres would remain static, but no acres would decrease in overall ecological condition. The net improvement in ecological condition class would be a change of less than 5 percent, from fair to good (Appendix 16, Anticipated Change in Ecological Condition Class).

Improvement in plant vigor and ecological trend would result from deferment of spring livestock use in three allotments, development of 12 water projects and treatment of 3,800 acres. One grazing system would be continued for the Green River AMP, a grazing system would be prepared for Birchell, and a grazing system would be revised for West Tabyago AMP. Water developments in Oil Shale, Pack Mountain, and Tabyago allotments would improve livestock distribution and forage utilization. Land treatments would improve range conditions in Birchell, Tabyago, Upper Showalter, Ute, and West Tabyago allotments adding 3,160 AUMs of forage.

Livestock would increase to 12,649 AUMs, 18 AUMs above active preference. This increase would occur in the Ute and Birchell allotments, resulting from land treatments.

Wild horses would be allocated 710 AUMs under this alternative. Approximately 316 AUMs would result from land treatments and 223 AUMs would be taken from wildlife. Approximately 171 AUMs would be taken from the Horse Point allotment (within the Book Cliffs locality). The wild horse numbers would be in balance with the carrying capacity of the range.

Authorized deer use would not change from current use as previously discussed in the Bonanza-Rainbow locality.

Authorized elk use would not change from current use as previously discussed in the Book Cliffs locality.

Approximately 38 AUMs would be lost to mineral developments.

## WILDLIFE/WILD HORSES

### BLM Impacts

The utilization of 17,287 AUMs of existing forage from BLM lands by big game species, an additional 1,325 AUMs from Dinosaur National Monument, and 710 AUMs by wild horses would be sufficient to support near current big game and substantially decreased wild horse numbers. This level of forage utilization would be 69 percent (39,315 AUMs) short of meeting the requirements of the UDWR prior-stable wildlife objectives. The Blue Mountain mule deer herd (26) would be reduced by 427 head (27 percent) as a result of livestock increases. This alternative would also result in a decrease of 76 percent (2,220 AUMs) of the forage required to meet the Vernal District wild horse objective population levels.

The distribution of the various species would be as follows: 302 antelope (166 at Bonanza-herd unit 7, and 136 at East Bench); 7,300 mule deer (1,100 at Blue Mountain-herd unit 26, and 6,200 at Book Cliffs-herd unit 28A); 500 elk (all located at Book Cliffs-herd unit 21); 60 wild horses (all located at Hill Creek). The Bonanza antelope herd would decrease by 309 animals (from current numbers) as a result of AUM reductions to wildlife and greatly increased livestock numbers. The Bonanza and Winter Ridge wild horse herds would be eliminated; populations would be managed at the Hill Creek herd location.

Projected oil and gas development would have the same effect as previously described under the Current Management Alternative (Appendix 15-C, Forage Impacts).

Projected underground oil shale development could significantly affect crucial antelope habitat. Potential in situ oil shale development would significantly affect crucial winter mule deer and elk habitat. In addition, proposed tar sand development would significantly affect additional crucial mule deer, elk, and wild horse habitat. These wildlife species would be displaced to adjoining habitat and be subject to crowding, stress, and competition for available food, water, and cover (Hamilton 1984) (Appendix 15-C, Forage Impacts).

An unquantifiable amount of habitat adjoining oil and gas, tar sand, and oil shale developments would be abandoned by most wildlife species as a result of disturbance (harassment), noise, and poaching. Indirect wildlife losses could increase significantly because of poaching and harassment from increased human populations. Gilsonite and sand and gravel development would not significantly affect any crucial wildlife habitat (Appendix 15-C, Forage Impacts).

Increased livestock production under this alternative would significantly affect certain wildlife populations. Deer and elk would be crowded into small areas of suitable habitat and be exposed to stress, inadequate amounts of forage and water, and increased poaching.



## CHAP. 4 —COMMODITY PRODUCTION ALTERNATIVE

Annual depletion of 56,000 acre-feet of water from the White River could jeopardize the continued existence of two endangered fish species, the Colorado squawfish and humpback chub, and another species that is a candidate for listing, the razorback sucker. No impacts to the species would occur if the water is purchased from the White River Dam Project (WRDP) because of agreed upon conservation measures in the biological opinion for that project (FWS 1982). However, the White River Dam Project could not supply water for all projects proposed in the UBS Development EIS and this additional oil shale development. If the water is not purchased from WRDP, the degree of impact would be determined in the Fish and Wildlife Service's Biological Opinion.

### WOODLANDS

#### BLM Impacts

By 1995, demand resulting from BLM projects would be approximately 1,900 cords per year.

Restrictions imposed upon woodland management by other resources would limit the allowable cut to 3,730 cords annually produced from 31,100 acres of woodland. Twenty acres would be eliminated from the woodland management to protect recreation sites, 680 acres would be lost to rights-of-way placed in utility corridors, 18,100 acres would be eliminated by tar sand development and 1,500 acres would be used for oil shale development. One hundred acres would be lost to wildfires over a ten-year period. In total, 20,400 acres capable of contributing 1,740 cords of firewood to the annual allowable cut, would not be available for harvest and use by wood cutters.

Livestock grazing in cottonwood stands could prevent the establishment of seedlings. Cottonwood stands would grow old, and when removed by harvest or natural processes, would not be replaced by natural regeneration.

### RECREATION

#### BLM Impacts

As a result of BLM projects, big game hunting opportunities would increase by 1,560 visitor days. The demand for all other recreation activities except big game hunting would increase by 5,900. However, 200 visitor days would be foregone as a result of ORV restrictions.

By not restricting ORV use designation of lands for ORV use would result in several impacts contiguous to the Uintah and Ouray Indian Reservation in the Hill Creek area, BLM's ORV plan would be inconsistent with the existing Tribal plan. The White River canyon would be opened to ORV use, which could lead to a loss of primitive recreational values. There would be a loss of recreation values by not protecting scenic travel corridors, Musket Shot Spring, or Grand Valley overlooks.

The protective status prohibiting development in White River Canyon would be dropped. The placement of structures, such as pipelines, along and across the river would adversely affect the semi-primitive setting.

Increased water demands from tar sand and oil shale development would deplete flows on the White River to the minimum level on average water years. Minimum flows would result in marginal canoeing.

Utility and transportation corridors would cross 6,700 acres or 13 percent of the visual resource management Class II, and 6,700 acres or 9 percent of Class III. Certain types of rights-of-way placed in the corridors would not comply with the visual standards of these classes. Impacts would, however, be minimized by consolidating land-disturbing activities to designated corridors. This would prevent the proliferation of construction scars and man-made intrusions due to random crisscrossing of the landscape.

Nine percent of the oil shale priority use leasing area and two percent of the area available for tar sand leasing contains Class II visual management standards and development would conflict with the visual standards. Development would create an unacceptable contrast with the natural environment.

Potential deposits of sand and gravel along the Green River from Ouray to Sand Wash, if developed, could contrast with the existing landscape. Development of 420 acres of potential sand and gravel deposits along the Green River from Dinosaur National Monument to Jensen and 1,800 acres along the White River would not conform with VRM Class II and would contrast with the existing landscape.

As a result of dropping the designation for the Book Cliffs Mountain Browse Natural Area, approximately 30 AUMs would become available for grazing and 400 acres would become available for mineral leasing.

### FIRE MANAGEMENT

#### BLM Impacts

Full suppression of wildfire would protect approximately 84,500 acres throughout the BCRA, safeguard private property, and prevent the spread of wildfire to non-Federal lands.

Approximately 13,000 to 28,500 acres would be prescribed burned over the next 10 years, providing additional forage for livestock (under this alternative, prescribed burns would not be initiated to enhance wildlife habitat or forage). The net effect of prescribed burns would be a significant increase in forage available for livestock and a potential reduction in wildlife habitat. These projects could occur in any vegetation-type or locality.



## CHAP. 4 —COMMODITY PRODUCTION ALTERNATIVE

### WATERSHED

#### Water Use

##### BLM Impacts

Development of four additional oil shale tracts would require approximately 56,000 acre-feet of water per year for underground mining (Table 4-12). That amount is 12 percent of the average annual flow of the White River. Less water would be required if modified in situ techniques are employed.

If the water could not be purchased from other water users with valid rights, development could be delayed or prevented, since the White River is essentially closed to further appropriation.

#### Water Quality

##### BLM Impacts

Less restrictive mineral leasing and ORV travel restrictions on public water reserves and floodplains would lead to a slight, unquantifiable deterioration of water quality.

The Detailed Development Plan for the White River Shale Project assumes no wastewater discharge from tracts U-a and U-b (Bechtel Petroleum, Inc. 1981). Using the same assumption for any additional oil shale leases leads to the conclusion of no impact to water quality. However, the wastewater would contain high concentrations of ammonia, sulfide, phenols, oil and dissolved solids, and has the potential to pollute both groundwater and surface water if any seepage or accidental discharge occurs. Based on depletion information in the UBS Development EIS (BLM 1982b), diverting 56,000 acre-feet per year from the White River would increase total dissolved solids concentrations at the mouth of the White River by 5.2 mg/l and by 2 mg/l at Imperial Dam. This increase would be less than 1 percent.

#### Soils

##### BLM Impacts

Surface disturbance of 13,400 to 22,700 acres for tar sand recovery, 1,200 to 1,600 acres for oil shale mining, 1,200 to 3,800 acres for oil and gas production, would increase soil erosion in the BCRA. Reclamation would reduce the average annual disturbance to about 5 to 10 percent of the total. Sediment yields from reclaimed surface mines were 300 to 600 percent higher than for undisturbed sites (Lusby and Toy 1976). In the Piceance Basin of Colorado, increases in sediment yield of 5.8 to 11.6 tons per acre per year during initial construction of oil shale mining sites and 2.9 tons per acre per year after construction were reported (Frickel, et al. 1975). Assuming a tripling of soil loss from disturbed sites in the BCRA, an additional 45,800 to 81,500 tons of soil would be lost in the next 10 years. Although this additional

soil loss is less than one percent of the current soil loss from the entire BCRA, localized impacts could be severe with gully formation in areas with reduced vegetation cover.

Less restrictive mineral leasing and ORV categories in critical and severe erosion condition areas would result in unquantifiable increases in soil erosion.

Confining major rights-of-way to 62.3 miles of corridors totaling 23,000 acres in severe and critical erosion condition would result in disturbance of fewer acres and thus, decreased soil erosion.

Constructing up to 320 detention-retention dams on 6,400 acres in severe and critical erosion condition areas, would reduce soil loss by 41,000 tons over the next 10 years. The short-term increase in wind and water erosion resulting from construction would be insignificant.

### Floodplains

##### BLM Impacts

Floodplain condition would not be significantly affected by implementation of any BLM actions considered for this alternative.

### Boulevard Ridge Study Area

##### BLM Impacts

Discontinuing protection for the watershed study area would result in an unquantifiable amount of surface disturbance from livestock grazing, mineral development and other resource uses.

## LAND TENURE ADJUSTMENT

##### BLM Impacts

Land ownership could change on up to 16,000 acres available for exchange. Up to 10,000 acres could be acquired by BLM, if they become available (Figure 2-7). No applications or specific proposals have been received for lands identified for disposal, so an impact analysis is not possible at this time. The lands identified for acquisition have high mineral values and would improve administration of proposed development areas under this alternative. Site specific environmental analyses would be done prior to disposal or acquisition of these lands.

## AIR QUALITY

##### BLM Impacts

The impacts described here are based primarily on previous analysis (Aerocomp 1984, Dietrich, et al. 1983). Aerocomp determined expected impacts for 25,000 bpd and 100,000 bpd of tar sand development in the PR Spring area. The impacts from the 60,000 bpd tar sand production



## CHAP. 4 —COMMODITY PRODUCTION ALTERNATIVE

considered here are expected to be intermediate between the impacts assessed by Aerocomp. Direct impacts from new oil shale leasing at up to 180,000 bpd, would double the impacts assessed by Dietrich, et al. for an 80,000 bpd scenario.

The National Ambient Air Quality Standards (NAAQS) and Class II increments for TSP would be exceeded, mainly from surface mining activities and travel on unpaved roads. SO<sub>2</sub> impacts would be close to the Class II 24-hour increment. Nitrogen dioxide concentrations would be well within the NAAQS.

Highly visible atmospheric discoloration would occur at the Uintah and Ouray Indian Reservation and near the synfuel facilities. Less visible perceptible discoloration may occur at Dinosaur and at Colorado National Monuments.

### SOCIOECONOMICS

Methodologies and computations that were used to estimate economic impacts are discussed in Appendix 12 (Methodology for the Economic and Social Analysis).

#### Economic Conditions

##### BLM Impacts

Oil and gas production and subsequent employment and personal income opportunities would not significantly differ from that analyzed in the Current Management Alternative.

In areas where mineral resources overlap (e.g. oil shale, gilsonite, tar sand, oil and gas), only one resource could be developed at a time. In certain cases, the remaining mineral resources could not be developed at all. As a result, unquantified employment and personal income opportunities associated with development of these other resources would be delayed or not realized. These losses would be insignificant.

Gilsonite, sand and gravel, and miscellaneous mineral activities would continue essentially unchanged from that level discussed under the Current Management Alternative.

Production from BLM oil shale and tar sand leases, and therefore, local employment, population growth infrastructure needs, and fiscal problems would be greatest under this alternative. The resulting population increases are shown in Table 4-20.

Implementation of this alternative could increase the region's population by 40,448 by 1995. Including baseline population projections, Uintah County and the communities and surrounding areas of Roosevelt and Vernal would, at some time, need to accommodate a greater than 10 percent annual growth rate. The communities of Dinosaur and Rangely would, at some time, need to accommodate a greater than 5 percent annual growth rate.

The increased relative importance of the high-paying mining and construction sectors, and the increased demand for workers in other sectors would increase the region's per capita income by an unknown amount.

Population growth would require infrastructural improvements similar to those discussed under the Resource Protection Alternative but to a greater degree. The additional regional infrastructural needs are presented in Table 4-21. These needs can be estimated for each community by comparing the projected population increases of that community (Table 4-20) with the projected population increases of the region (Table 4-21) and applying the resulting proportion to the projected infrastructure needs of the region (Table 4-21).

The fiscal problem and issues related to rapid population growth would be similar to those discussed under the Resource Protection Alternative except that these problems would be more widespread.

The management actions would affect the amount of public rangeland forage that would be available to livestock operators. This could monetarily affect ranchers' incomes, and abilities to obtain loans, with some secondary income and employment effects through the local economy.

Compared to their existing use, 16 of the cattle operators would, on the average, have eight percent more usable forage. If the added forage were grazed, cattle operators would realize an added \$8,224 in returns above cash cost, a one percent increase over what these operators now earn.

Compared to their existing use, five of the sheep operators would, on the average, have five percent more usable forage. If the added forage were grazed, sheep operators would realize an added \$6,978 in returns above cash cost, a less than one percent decrease in their returns above cash cost.

Compared to existing use, none of the livestock operators would have less available forage. If minerals developments were concentrated in several allotments rather than spread among all allotments with mineral development potential, as was assumed in the analysis, 15 livestock operators would have two percent less forage, resulting in less than a one percent decrease in their returns above cash cost.

The number of livestock operators affected to varying degrees, and the total rancher income are shown on Tables 4-22 and 4-23, respectively.

Any increase from active preference could affect operator wealth. Under this alternative, total long-term grazing privileges would be 6,590 AUMs above active preference. At a market value of \$60 per AUM for BLM grazing permits, total operator wealth could increase by as much as \$394,200, a two percent increase in base property value. Appendix 12 (Methodology for the Economic and Social Analysis).

BLM wildlife management actions would keep the big game populations near stable; however, human population



Table 4-20

Population Projections  
for  
Commodity Production Alternative

Area	1982			1985			1990			1995			2000		
	Base	Base	BLM	Other	Base	BLM	Other	Base	BLM	Other	Base	BLM	Other	Base	BLM
Duchesne	15,273	17,778	0	4,965	18,632	2,575	10,226	18,684	4,135	13,082	18,929	4,135	15,723	18,929	4,135
Roosevelt CCD	11,827	13,695	0	348	15,057	2,549	3,019	15,005	4,093	3,122	14,636	4,094	3,799	14,636	4,094
Roosevelt	4,678	5,416	0	244	5,955	1,759	2,057	5,934	2,824	2,106	5,789	2,825	2,599	5,789	2,825
Myton	609	705	0	12	775	53	103	773	85	105	754	85	130	754	85
Other	6,540	7,514	0	92	8,327	737	859	8,298	1,184	911	8,093	84	1,070	8,093	84
Other	3,446	10,204	0	4,617	3,575	26	7,207	3,679	42	9,960	4,293	40	11,924	4,293	40
Uintah	24,170	25,730	0	18,940	29,326	17,520	35,679	29,863	28,127	45,196	28,985	28,127	53,500	28,985	28,127
Uintah-Ouray	4,737	5,061	0	40	5,699	526	726	5,730	562	698	5,565	562	757	5,565	562
Ballard	678	775	0	20	966	175	315	976	281	297	926	281	619	926	281
Other	4,059	4,286	0	20	4,733	351	411	4,754	281	401	4,639	281	138	4,639	281
Vernal	19,417	20,653	0	1,413	23,611	12,614	10,242	24,117	27,002	12,154	23,404	27,283	14,755	23,404	27,283
Vernal	8,549	9,291	0	565	11,065	5,606	4,148	11,369	12,095	4,912	10,941	12,376	5,972	10,941	12,376
Other	10,868	11,362	0	848	12,546	7,008	6,094	11,389	14,907	7,242	12,463	14,907	8,783	12,463	14,907
Bonanza	16	16	0	178	16	4,380	1,575	16	563	0	16	281	0	16	281
Moffat-Rio Blanco	23,934	24,355	0	146	28,345	613	1,738	27,646	984	2,016	28,144	984	2,403	28,144	984
Dinosaur	451	501	0	64	405	343	810	425	551	943	437	551	1,124	437	551
Rangely	3,235	3,193	0	82	3,993	270	928	3,805	433	1,073	3,962	433	1,279	3,962	433
Grand	8,100	9,850	45	691	10,570	830	834	10,324	6,215	915	9,676	2,372	919	9,676	2,372
Thompson		380	45	691	366	830	834	366	6,215	915	365	2,372	919	365	2,372
Westwater		38	45	691		830	834		6,215	915		2,372	919		2,372
Mesa			17			307			2,295			877			

CCD: Census County Division



## CHAP. 4 — COMMODITY PRODUCTION ALTERNATIVE

TABLE 4-21

Commodity Production Alternative  
Summary of Regional Socioeconomic Impacts  
Resulting from BIM Actions

Socioeconomic Development Category	Change From Projected Baseline			
	1985	1990	1995	2000
Population Growth				
Total	-	21,962	40,448	36,605
School Age	-	4,562	10,324	10,598
Employment Growth	-	11,231	19,368	15,068
Household Growth	-	7,688	13,433	10,145
Infrastructure Requirement				
Housing				
Single family	-	4,622	8,035	6,092
Multi-family	-	1,166	2,017	1,534
Mobile homes	-	1,933	3,356	2,544
Education				
Students	-	4,562	10,324	10,597
Classrooms	-	194	423	432
Teachers	-	194	423	432
Health Care				
Hospital beds				
General care	-	57	96	80
Long-term care	-	27	46	55
Medical personnel				
Doctors	-	27	40	33
Dentists	-	27	34	30
Nurses	-	48	82	70
Public health nurses	-	21	25	20
Medical health care				
Clinical psychologists	-	21	22	18
Mental health workers	-	21	22	18
Public Safety				
Law Enforcement				
Police officers	-	27	46	80
Patrol cars	-	27	46	80
Jail space (sq. ft.)	-	10,931	20,883	18,254
Juvenile holding cells	-	21	22	20
Fire Protection				
Fire flow (gpm)/ duration (hr)				
Emergency Medical Services				
Ambulances	-	9	25	20
Emergency medical technicians	-	147	173	141



## CHAP. 4 —COMMODITY PRODUCTION ALTERNATIVE

TABLE 4-21 (Continued)

Commodity Production Alternative  
Summary of Regional Socioeconomic Impacts  
Resulting from BLM Actions

Socioeconomic Development Category	Change From Projected Baseline			
	1985	1990	1995	2000
Utility Service Demands				
Water System				
Connections	-	5,554	10,293	9,041
Supply (10 <sup>6</sup> gal/yr.)	-	3,244	6,010	5,280
Storage (10 <sup>6</sup> gal/yr.)	-	1,621	3,006	2,640
Treatment (10 <sup>6</sup> gal/yr.)	-	3,244	6,010	5,280
Sewage System (10 <sup>6</sup> gal/yr.)	-	625	1,163	1,022
Solid Waste <sup>a</sup>				

Source: BLM 1983h.

<sup>c</sup>Fire protection measured in fire flow (gpm)/duration (hr) cannot be aggregated across the affected counties.

<sup>d</sup>The State of Utah community facility guidelines do not include a solid waste standard. Therefore, an estimate of solid waste disposal impacts could not be determined.



## CHAP. 4 —COMMODITY PRODUCTION ALTERNATIVE

TABLE 4-22

Number of Operators Affected Under the Proposed  
Plan and Degree of Impact

	Percent Increase From Existing Use and Revenues			Not Affected	Percent Decrease From Existing Use and Revenues		
	50-100	11-50	1-10		1-10	11-50	51-100
Public Rangeland Forage		7	13	19			
Operator Returns Above Cash Cost		3	17	19			

Note: Changes are based on average use over the past 3 years.

TABLE 4-23

Summary of Short-Term and Long-Term Economic Impacts  
to Livestock Operators in Dollars

	<u>Current Situation</u>	<u>Commodity Production</u>
<u>Cattle Operators</u>		
Gross Revenue	\$2,415,282	\$2,420,168
Total Cash Cost	1,441,458	1,438,120
Returns Above Cash Cost	973,824	982,048
Returns to Labor and Investment	526,204	535,760
<u>Sheep Operators</u>		
Gross Revenue	\$3,585,258	\$3,594,551
Total Cash Cost	1,509,804	1,512,119
Returns Above Cash Cost	2,075,454	2,082,432
Returns to Labor and Investment	1,719,522	1,726,305



## CHAP. 4 —COMMODITY PRODUCTION ALTERNATIVE

increases could increase hunting by 1,560 hunter days by 1995, and increase revenues to the local economy by \$70,200. The increase would be 23 percent higher than present levels.

Human populations are projected to be the largest under this alternative. These people would cause significant long-term increases to the recreation sector. Recreation use could increase by 5,900 recreation days by 1995 and increase revenues to the local economy by \$265,500. This increase would be 82 percent higher than present levels.

### BLM Social Conditions

The social effects resulting from the projected population increases would be similar to those that would occur under the Resource Protection Alternative. However, the effects of implementing this alternative would be more intense and widespread. The difference would be in degree, not in the nature of the impact.

## TRANSPORTATION

### BLM Impacts

By 1995, BLM actions could increase traffic volumes on the four major highways in the areas by 16 percent (refer to Table 4-18). Highway levels of service could be reduced, but by an unknown amount. Traffic accidents and road deterioration would increase by an unquantifiable amount. Operating speeds would drop and an increased number of stoppages would occur.

## UNAVOIDABLE ADVERSE IMPACTS

Development of mineral resources such as oil and gas, tar sand, and oil shale would cause surface disturbance and a modification of topography. Such disturbances could adversely affect other surface uses and resources. Approximately five percent (1,507 acres) of the area disturbed by minerals would be used for plant sites and facilities. These areas would be lost for forage production.

Implementation of this alternative would have the greatest potential to adversely affect wildlife and wild horse populations. The emphasis on minerals development would preclude wildlife habitat improvement projects and an unquantifiable, yet significant portion of wildlife and wild horse habitat would be lost. Wild horses would be managed at much lower levels and at only one location. In most cases, increased livestock forage utilization levels would allow sufficient forage for current wildlife population levels.

Because critical and severe erosion areas would not be protected from woodland harvest, clear cuts could change the timing of runoff and possibly increase erosion.

Obtrusive developments, such as overhead power and communication lines, within the designated utility and transportation corridors would not comply with visual resource management Class II and Class III areas.

Due to proposed tar sand and oil shale development, insufficient water flows could preclude floatboating during midsummer to the late fall on the White River.

Salinity would increase at the mouth of the White River by 5.2 mg/l and at Imperial Dam by 2 mg/l.

An additional 45,800 to 81,500 tons of soil would be lost to erosion as a result of mineral development.

Even with mitigating measures, TSP standards could be exceeded at many areas, including Dinosaur National Monument; the Uintah and Ouray Indian Reservation; Vernal, Utah; and Rangely, Colorado. Atmospheric discoloration would be visible near synthetic fuel facilities and power plants, the Uintah and Ouray Indian Reservation, and possibly at Dinosaur and Colorado National Monuments.

## IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

Based on present technology, minerals mined and subsequently consumed, or left underground as unrecoverable, would be irretrievably lost. Tar sand strip mining could permanently alter the site potential on approximately 1,250 acres. In situ oil shale development could permanently alter the site potential on approximately 2,500 acres. The changes would be irreversible.

Soils lost due to surface disturbing activities would be irretrievably lost.

Allowing development in the Boulevard Ridge control study area would negate the possibility of obtaining future scientific data from that site.

Some degradation of air quality would be irreversible due to established urbanization in the area after closure of the oil shale and tar sand facilities.

A decision to select this alternative would call for the conversion of additional non-Federal agricultural lands to support urban development. It would lock people into an expanding social system that in many ways would be irreversible and, in turn, would probably solidify a new lifestyle for area residents.

## SHORT-TERM USE VERSUS LONG-TERM PRODUCTIVITY

Because of the number and amount of minerals considered unrecoverable with present mining technology and practices, loss of mineral production could occur in the long term to achieve short-term minerals production.

A total of 30,200 acres would be treated, resulting in an additional 2,700 annual AUMs of forage. Although a short term loss of forage and habitat would occur as a result of forage and habitat improvement projects, a long-term forage and habitat benefit would occur.



## CHAP. 4 —COMMODITY PRODUCTION ALTERNATIVE

Mineral development could cause long-term elimination of forage and habitat. The duration of the impacts would depend on the amount of annual precipitation and the degree of the reclamation success. Reclamation could take up to 30 years in areas which receive less than 10 inches of precipitation annually.

Harvest of firewood would increase long-term forage production.

Over the long term, 1,000 acres of productive woodlands could be lost to oil shale development and 18,100 acres to tar sand development.

Wildfires occurring in pinyon/juniper stands would halt regeneration by destroying the seed source. Reestablishment of stands would be delayed 40 to 80 years. Depending on the size of the burn, the allowable cut would be reduced. Less pinyon and juniper firewood would be available for firewood cutters.

In the short term, areas developed for tar sand and oil shale would be adversely affected by a loss of visual quality to the natural landscape. It would be expected that the majority of the disturbance would be unnoticeable following a period of successful reclamation.

The 56,000 acre-feet of water used to develop four additional oil shale tracts would not be available for other uses until the projects would be terminated. Water quality would be restored when the depletion is no longer needed.

An unquantifiable amount of soil would be lost during construction of detention-retention dams; however, their construction would reduce soil loss by 41,000 tons over the next 10 years.

The PSD air quality increments would be available for other projects after completion of the oil shale and tar sand developments.

### CUMULATIVE SUMMARY

Direct cumulative impacts on minerals would generally be the same as were discussed under the BLM Impacts for this alternative. Air quality permits and water supplies would be available for additional oil shale and tar sand projects if considered separately from interrelated projects. When considered cumulatively, air quality permits and sufficient water supplies may not be available, delaying development of Federal oil shale and tar sand resources.

Livestock use would be increased 6,570 AUMs above active preference. This would be approximately six percent over active preference and a 63 percent increase from average use (present operating levels). BLM actions would result in improvement in ecological condition in 30 allotments and a static condition in 24 allotments. No allotments would decline in ecological condition. Approximately 642,300 acres would improve, and 472,900 acres would remain in static condition. The net improvement in fair to good ecological condition would be a change of approximately 1 percent from fair to good ecological condition.

An estimated 3,856 AUMs would be lost due to mineral development activities; however, land treatments would add an estimated 2,700 AUMs of forage.

Cumulative impacts of interrelated projects (-910 AUMs) and BLM actions (16,570 AUMs) would result in an increase of 41,595 AUMs from average livestock use. This increase would be 5,660 AUMs above active preference.

Wildlife use would decrease by 1,219 AUMs (seven percent) below current use. This represents a 60 percent decrease from the allocated level of 43,638 AUMs.

Wild horses would be allocated 710 AUMs, an increase from no allocation, but a 71 percent decrease from average use. Wild horses would be removed from the Bonanza-Rainbow and Book Cliffs localities.

By 1995, the cumulative demand for firewood could reach 8,400 cords per year. Firewood demand would exceed the allowable cut by 4,670 cords annually. The BLM would not be able to supply fuelwood for over half of the people seeking it.

Visitor days for big game hunting resulting from BLM and interrelated projects would expand from the 1982 level of 6,770 to 11,745, for an increase of 4,975 visitor days by 1995.

Increased energy development, coupled with increased population would decrease the quality of the areas available for dispersed recreation. Increased vandalism would also occur.

Big game numbers are not expected to increase over current levels. The number of hunter visitor days would almost double and as a result, hunting quality would be expected to decrease.

Demand for all other forms of recreation except big game hunting would expand from the current level of 7,200 to 24,900 visitor days or an increase of 17,700. This increase would expand demand for floating and fishing on the Green River, ORV travel and sightseeing.

Cumulative depletions would increase by 223,000 acre-feet per year or 48 percent of the average annual flow of the White River, exceeding by 114,000 acre-feet the capacity of the White River reservoir.

The cumulative increase in total dissolved solids concentration at Imperial Dam resulting from other projects and BLM actions would be 7 mg/l. This represents less than a one percent increase.

Cumulative impacts on soils would be the same as discussed in BLM impacts.

Impacts to floodplains are the same as in the Current Management Alternative.

Class II TSP standards would be exceeded at Dinosaur National Monument; the Uintah and Ouray Indian Reservation; Vernal, Utah; and Rangely, Colorado. Class II standards for SO<sub>2</sub> could possibly be exceeded in the BCRA. Yellow-brown atmospheric discoloration, resulting from emissions of nitrogen oxides from synthetic fuel



## CHAP. 4 —COMMODITY PRODUCTION ALTERNATIVE

facilities and power plants, would be visible from the Uintah and Ouray Indian Reservation and Dinosaur National Monument.

Cumulative impacts on infrastructure needs for the Commodity Production Alternative are summarized in Table 4-24. Population projections for Uintah and Duchesne Counties, and the communities of Roosevelt,

Myton, Ballard, Vernal, Dinosaur, and Rangely, show a need to accommodate a greater than 10 percent annual growth rate. Northern Grand County would need to accommodate a greater than 5 percent annual growth rate.

Cumulative transportation impacts are displayed on Table 4-19. All highways except County Road 262 would provide an unsatisfactory level of service.



## CHAP. 4 —COMMODITY PRODUCTION ALTERNATIVE

TABLE 4-24

Commodity Production Alternative  
Cumulative Infrastructure Needs  
BLM and Interrelated Projects

Socioeconomic Development Category	1985	1990	1995	2000
Population Growth				
Total	27,282	71,230	103,438	111,582
School Age	4,619	13,834	26,369	41,204
Employment Growth	15,817	36,822	47,571	47,121
Household Growth	8,264	22,870	31,803	31,306
Infrastructure Requirement				
Housing				
Single family	4,958	13,730	19,057	18,789
Multi-family	1,239	3,443	4,773	4,709
Mobile homes	2,066	5,730	7,949	7,835
Education				
Students	4,619	13,834	26,369	33,762
Classrooms	185	564	1,064	1,359
Teachers	185	564	1,064	1,359
Health Care				
Hospital beds				
General care	59	154	221	230
Long-term care	12	57	96	112
Medical personnel				
Doctors	16	57	77	78
Dentists	14	51	65	68
Nurses	46	132	188	196
Public health nurses	6	31	39	36
Medical health care				
Clinical psychologists	3	25	26	23
Mental health workers	4	27	28	27
Public Safety				
Law Enforcement				
Police officers	54	125	171	230
Patrol cars	54	125	171	230
Jail space (sq. ft.)	13,592	35,607	52,110	55,609
Juvenile holding cells	5	28	31	30
Fire Protection				
Fire flow (gpm)/ duration (hr)				
Emergency Medical Services				
Ambulances	6	19	39	36
Emergency medical technicians	38	215	268	251



## CHAP. 4 — COMMODITY PRODUCTION ALTERNATIVE

TABLE 4-24 (Continued)

Commodity Production Alternative  
Cumulative Infrastructure Needs  
BLM and Interrelated Projects

Socioeconomic Development Category	1985	1990	1995	2000
Utility Service Demands				
Water System				
Connections	8,769	21,399	30,441	33,143
Supply (10 <sup>6</sup> gal/yr.)	5,121	12,498	17,777	19,355
Storage (10 <sup>6</sup> gal/yr.)	2,561	6,248	8,890	9,677
Treatment (10 <sup>6</sup> gal/yr.)	5,121	12,498	17,777	19,355
Sewage System (10 <sup>6</sup> gal/yr.)	992	2,417	3,443	3,749
Solid Waste <sup>a</sup>				

Source: BLM 1983h.

<sup>c</sup>Fire protection measured in fire flow (gpm)/duration (hr) cannot be aggregated across the affected counties.

<sup>d</sup>The State of Utah community facility guidelines do not include a solid waste standard. Therefore, an estimate of solid waste disposal impacts could not be determined.



# BALANCED USE ALTERNATIVE

## MINERALS

### Interrelated Impacts

Refer to Current Management Alternative.

### Oil and Gas

#### BLM Impacts

Total annual production and associated disturbance would remain the same as discussed for the Current Management Alternative. The conflicts between the other surface resources (reflected by the category designations) and the potential and producing oil and gas areas are summarized in Tables 4-7 and 4-8.

As discussed in the Resource Protection Alternative, the potential exists for oil and gas developments to be inadvertently damaged or destroyed by oil shale construction activities.

### Oil Shale

#### BLM Impacts

Approximately 80,000 to 160,000 bpd could be produced on two to four future oil shale tracts located within the priority management area (Figure 2-16). Approximately 800 to 1,600 acres would be disturbed during the production phase. An additional 20,000 bpd could be produced on an in situ oil shale tract. Approximately 1,250 acres would be disturbed because of mining and related construction activities.

Air quality permits and water supplies would be available for additional oil shale projects if considered separately from interrelated projects. When considered cumulatively, air quality permits and sufficient water supplies may not be available.

### Tar Sand

#### BLM Impacts

Approximately 10,000 to 25,000 bpd could be produced on future combined hydrocarbon leases. Approximately 3,800 to 6,600 acres would be disturbed due to mining and related construction activities.

Special mitigating measures (lease categories) could affect tar sand development in a manner similar to that discussed in the Resource Protection Alternative with the exception that less acreage would be placed in Categories 3 and 4 if this alternative would be implemented. These are summarized in Table 4-11.

Approximately 12 percent of public land within the three STSAs would not be available for tar sand development (Table 4-11). Most of this land has been classified as having low potential for development (Table 4-11). Land would not be leased within the Naval Oil Shale Reserve.

### Gilsonite

#### BLM Impacts

Production levels and associated surface disturbance would remain the same as discussed in the Current Management Alternative.

### Sand and Gravel

#### BLM Impacts

Approximately 20 to 50 acres could be disturbed annually as a result of sand and gravel disposal actions.

### Building Stone

#### BLM Impacts

Three areas, totaling 21,500 acres in size, would be made available for building stone collection. The number of acres that would actually be disturbed is not known. Some 1,000 acres of building stone could be damaged or destroyed by development of the oil shale resource.

## RIGHT-OF-WAY CORRIDORS

#### BLM Impacts

Rights-of-way within designated corridors could affect up to 93,000 acres (Figure 2-26). Known resource conflicts would include wildlife habitat, floodplains, areas in critical and severe erosion condition, camp sites, productive woodlands, habitat for threatened and sensitive plant species, visual resources, and river corridors (Appendix 9, Utility Corridors and Segments by Alternative). Site specific environmental documentation would be prepared for construction within the 235 miles of proposed corridors when specific right-of-way applications are received.

## FORAGE

#### BLM Impacts

**Blue Mountain Locality:** Authorization of 5,711 AUMs for livestock and 1,768 AUMs for wildlife would result in an improvement in plant vigor and an upward trend in



## CHAP. 4 - BALANCED USE ALTERNATIVE

ecological condition. This would occur on all allotments except Cub Creek, where trend would be static. Approximately 29,000 acres (76 percent) would improve and the remaining 9,000 acres would stay in a static ecological condition. The net effect of the improvement in ecological condition class would be a change of 5 to 10 percent, fair to good to excellent (Appendix 16, Anticipated Change in Ecological Condition Class). The improvement would result from land treatments (7,160 acres, producing an additional 582 AUMs of forage), seven water developments, and management through grazing systems on the Stuntz Valley, Point of Pines, Doc's Valley, and Blue mountain allotments (Figure 2-27) (Appendix 5, Forage Actions by Alternative). No range would decline in overall ecological condition.

Sagebrush would decrease (by an unquantifiable amount) on the treated areas. The life of the treatments would be extended through the use of grazing systems. Implementation of the grazing systems would defer spring grazing, resulting in an improvement in ecological condition.

Total livestock decreases would amount to 76 AUMs below active preference (one percent). These decreases would be made in the Blue Mountain AMP, Cub Creek, Green River AMP, and Point of Pines AMP allotments, contributing to improved ecological condition.

Forage allocated for deer would increase by 768 AUMs above the allocated use to the same level as currently utilized in this locality. These additional AUMs would result from land treatments and forage which was initially allocated to livestock.

Minerals developments would result in an expected loss of eight AUMs Appendix 15 (Forage Impacts).

Under this alternative, the combined livestock and wildlife use shows an apparent deficit of 116 AUMs (1.6 percent) between the authorized use levels and the projected available forage. This apparent deficit is not expected to adversely affect the overall range condition for several reasons. Since the dietary requirements of deer and cattle are not the same, an unknown quantity of noncompetitive forage exists within this locality. An unknown quantity of wildlife forage would also be available on intermingled State and private lands. Finally, implementation of grazing systems would potentially improve the range condition by an unknown amount. The combination of these unknown factors would more than balance the apparent deficit. The monitoring program would be essential in determining the actual range condition and quantity of available forage under this approach.

**Bonanza-Rainbow Locality:** Authorization of 37,385 AUMs for livestock, no AUMs for wild horses, 1,123 AUMs for antelope, and an unknown portion of the deer use in deer herd unit 28A (proposed herd use for deer herd unit 28A is 32,577 AUMs) would result in an improvement in plant vigor and ecological condition on 24 allotments and remain stable on 5 allotments (Bohemian Bottoms, Brewer, Miners Gulch, White River, and White River Bottoms).

Approximately 527,000 acres (83 percent) would improve and the remaining 106,300 acres would remain in a static ecological condition. No range would decline in overall ecological condition. The net effect of the improvement in ecological condition class would be about 5 percent, from fair to good (Appendix 16, Anticipated Change in Ecological Condition Class). This improvement would result from several actions. Grazing pressure would be lessened as a result of the decrease in forage allowed for livestock use (approximately 24,000 AUMs) and the elimination of wild horse use (480 AUMs).

The use of grazing systems on 17 allotments would defer spring grazing and improve plant vigor. Grazing distribution would be improved by development of 56 water developments. Treatment of 1,000 acres would add an additional 68 AUMs (Appendix 5, Forage Actions by Alternative; Appendix 14, Anticipated Trend in Ecological Condition).

Total livestock use would amount to 37,385 AUMs, increasing above average use by 33 AUMs. Six allotments (Bohemian Bottoms, Halfway Hill, Watson, Spring Hollow, Stirrup, and White River) would be decreased below average use by a total of 30 AUMs, due to minerals developments.

Twenty-two allotments would be authorized at average use. The Raven Ridge allotment would be increased by 63 AUMs, as a result of land treatments.

Forage allocated for antelope would increase to 1,123 AUMs, a 260 percent increase above allocated use. The forage would be provided from the livestock AUMs that would be decreased from active preference.

Wild horses would be removed from this locality. The 480 AUMs of forage that they currently consume, would be available for livestock.

Authorized deer use in herd unit 28A, which encompasses the Bonanza-Rainbow, Book Cliffs, and Hill Creek localities, would be 32,577 AUMs. No attempt is made to break down this amount of forage by individual locality. It represents an increase of 19,793 AUMs (155 percent) above current use and would allow a substantial increase in the deer population. This additional forage would be derived from land treatments and unused forage initially allocated for livestock.

Minerals activities would result in a disturbance of approximately 6,544 acres for a loss of 932 AUMs. This forage would be taken from the unused forage that was initially allocated for livestock.

**Book Cliffs Locality:** Authorization of 17,351 AUMs for livestock, no AUMs for wild horses, and an unknown portion of the deer use in deer herd unit 28A and elk herd 21 (proposed herd use for deer herd unit 28A is 32,577 AUMs proposed herd use for elk herd unit 21 is 12,128 AUMs), would result in an improvement in plant vigor and ecological condition on five allotments and a stable condition on two allotments (McClelland and West Water Point). Approximately 260,100 acres (86 percent) would improve and the remaining 44,000 acres would remain stable. No range



## CHAP. 4 - BALANCED USE ALTERNATIVE

would decline in overall ecological condition (Appendix 14, Anticipated Trend in Ecological Condition). The new improvement in ecological condition class would be approximately 5 percent, from fair to good to excellent (Appendix 16, Anticipated Change in Ecological Condition Class). The imbalance between heavy use areas (drainage bottoms, water service areas, sheltering areas, etc.) and light or nonuse areas (benches, ridges, areas without water, etc.) would be corrected through development of range improvements (48 waters, 16 miles of fence, 10,500 acres of land treatment) and development of grazing systems (revision of 4 AMP's on Atchee Ridge, Sweetwater, Horse Point, and Winter Ridge) Appendix 5 (Forage Actions by Alternative). Land treatment would provide direct benefit by opening up sagebrush dominated sites, increasing edge effect and by increasing production and availability of forage. The vitality and life of treated areas would be extended through the proposed management actions.

Authorized deer use in herd unit 28A would increase 19,793 AUMs (155 percent) above current use, as previously discussed in the Bonanza-Rainbow locality.

Authorized elk use in herd unit 21 which encompasses the Book Cliffs and Hill Creek localities would be 12,128 AUMs. No attempt has made to break down this amount of forage by individual locality. It represents an increase of 8,936 AUMs (280 percent) above current use and would allow a substantial increase in the elk population. This additional forage would be derived from land treatments and unused forage initially allocated for livestock.

The maximum allowable use for deer in herd unit 28A would be set at 32,577 AUMs and the maximum level for elk in herd unit 21 would be 12,128, making a total allocation limit of 44,705 AUMs, which is 2,379 AUMs over the original allocation. The total wildlife forage demand would be provided by land treatments (1,406 AUMs) and unused forage initially allocated to livestock.

Wild horse use in the Winter Ridge herd unit (Winter Ridge allotment) would be eliminated under this alternative. The 108 AUMs currently used by wild horses would be returned to livestock since no allocation was ever made for the wild horses.

The Hill Creek wild horse herd unit (primarily in the Hill Creek locality) overlaps into the Book Cliffs locale (Horse Point allotment). To satisfy the forage demand by wild horses, 171 AUMs would be allocated for their use. These AUMs would be derived from land treatment work in the Horse Point allotment (Appendix 5, Forage Actions by Alternative) and Figure 2-27.

Minerals (surface disturbing activities) would eliminate 1,175 AUMs (Appendix 15, Forage Impacts). This impact would be compensated for by AUMs derived from the land treatment.

**Hill Creek Locality:** Authorization of 6,440 AUMs for livestock, 2,340 AUMs for wild horses, and an unknown portion of the deer use in deer herd unit 28A and elk herd unit 21 (proposed herd use for deer herd unit 28A is 32,577; proposed herd use for elk herd unit 21 is 12,128 AUMs),

would result in an improvement in plant vigor and ecological condition on four allotments (Birchell, Green River AMP, Upper Showalter, and West Tabyago) and remain stable on the remaining eight allotments. Approximately 30,800 acres (22 percent) would improve and the remaining 109,200 acres would remain in static ecological condition. No range would decline in overall ecological condition. The improvement would result from grazing systems (on the Birchell, Green River AMP, and West Tabyago allotments) and land treatments on 600 acres. Exclusion of livestock from 260 acres of the Green River AMP allotment would result in an improvement in riparian habitat (Appendix 5, Forage Actions by Alternative; Appendix 14, Anticipated Trend in Ecological Condition). The net improvement to ecological condition class would be about 1 percent, from fair to good (Appendix 16, Anticipated Change in Ecological Condition Class).

Average livestock use would be authorized on all allotments. This would be a decrease of 6,191 AUMs (49 percent) below active preference.

Forage formally allocated to wild horses would amount to 2,340 AUMs. This would be 459 AUMs more than current use and a total increase of 2,340 AUMs (since no use has been allocated to wild horses). This increased use would come from livestock decreases and land treatments. Forage for wild horses would be allocated on 7 allotments (Lower Showalter, Oil Shale, Pack Mountain-Wild Horse, Tabyago, Upper Showalter, Ute, and West Tabyago).

Authorized deer use in herd unit 28A would increase 19,793 AUMs (155 percent) above current use as previously discussed in the Bonanza-Rainbow locality.

Authorized elk use in herd unit 21 would increase 8,936 AUMs (280 percent) above current use as previously discussed in the Book Cliffs locality.

Additional forage would be derived from land treatments and unused forage initially allocated for livestock.

Minerals activities would eliminate approximately 37 AUMs of forage (Appendix 15, Forage Impacts).

## WILDLIFE/WILD HORSES

### BLM Impacts

The utilization of 47,596 AUMs of existing forage from BLM lands by big game species, an additional 1,325 AUMs from Dinosaur National Monument, and 2,340 AUMs by wild horses, would be sufficient to support increased big game herds and slightly reduced wild horse populations.

This level of utilization would be 16 percent or 9,006 AUMs short of meeting the forage requirement of the UDWR prior-stable big game population goals. In addition, the utilization level would be 20 percent (600 AUMs) short of reaching the forage requirement of the Vernal District wild horse population objectives. The distribution of the various wildlife species would be as follows: 900 antelope (600 at Bonanza-herd unit 7, 300 at East Bench); 17,300



## CHAP. 4 - BALANCED USE ALTERNATIVE

mule deer (1,500 at Blue Mountain-herd 26, 15,800 at Book Cliffs-herd 28A); 1,900 elk (all located at Book Cliffs-herd 21); 195 wild horses (all located at the Hill Creek herd location).

Surface disturbance from projected oil and gas development would affect crucial antelope, elk, mule deer, and wild horse habitat as previously described under the Current Management Alternative.

Oil shale development and development of tar sand resources would result in a loss of forage, and displacement of wildlife (Hamilton 1984) (Appendix 15, Forage Impacts). Crowding, stress, and competition for forage, water, and cover could result.

An unquantifiable amount of habitat adjoining oil and gas, tar sand, and oil shale developments would be abandoned by most wildlife species as a result of noise, disturbance (harassment), and poaching. Gilsonite and sand and gravel development would not significantly affect any crucial wildlife habitat (Appendix 15, Forage Impacts).

The combined effects of oil and gas, oil shale, and tar sand development, coupled with increases in livestock production, would be significant (Appendix 15, Forage Impacts).

Annual depletion of 28,000 to 56,000 acre-feet of water from the White River could jeopardize the continued existence of two endangered fish species, the Colorado squawfish and humpback chub, and another species that is a candidate for listing, the razorback sucker. No impacts to the species would occur if the water were purchased from the WRDP because of agreed upon conservation measures in the biological opinion for that project (FWS 1982). However, the White River Dam Project could not supply water for all projects proposed in the UBS Development EIS and this additional oil shale development. If the water is not purchased from WRDP, the determination of the degree of impact will be determined in the Fish and Wildlife Service's Biological Opinion.

## WOODLANDS

### BLM Impacts

Restrictions imposed upon woodland management by other resources would limit the allowable cut to 4,270 cords per year produced from 39,600 acres. Fifty acres would be eliminated from the woodland management to protect recreation sites, 3,500 acres would be removed to protect severe and critical erosion areas, 160 acres would be lost to rights-of-way placed in utility corridors, 4,300 acres would be used for tar sand, and 590 acres would be used for in situ oil shale development. Over a ten-year period, 100 acres would be lost to wildfires and 1,200 acres would be set aside to protect crucial wildlife habitat on Lower McCook Ridge. In total, 9,900 acres capable of contributing 900 cords of firewood to the annual allowable cut would be set aside or used for purposes other than wood production. By 1995, demand resulting from BLM projects would be approximately 1,600 cords annually.

During harvest activities, big game would be displaced. Creation of additional openings or "edge" would benefit both small and big game animals.

Livestock grazing in cottonwood stands could prevent the regeneration of seedlings. The cottonwood stands would grow old and when removed by harvest or natural processes, would not be regenerated naturally.

## RECREATION

### BLM Impacts

As a result of BLM projects, big game hunting opportunities would increase by 3,350 visitor days.

The demand for all recreation activities except big game hunting would increase by 4,700 visitor days. On the other hand, 500 user days would be foregone as a result of proposed ORV closures and restrictions. Affected would be off-road travel by rabbit hunters and "bikers" in the Bonanza area.

By limiting ORV use contiguous to the Uintah and Ouray Indian Reservation in the Hill Creek area, BLM's ORV plan would be consistent with the existing Tribal plan.

There would be a loss of aesthetic and interpretive values by not continuing to protect the Grand Valley and Musket Shot Spring overlooks.

Water demands for energy development would deplete flows on the White River to minimum on average water years. Minimum flow would make floatboating marginal.

Development of some 500 acres of potential sand and gravel deposits along the Green River from Jensen to the new Bonanza Highway bridge would be in nonconformance with VRM Class III and would contrast with the existing landscape.

Utility and transportation corridors would cross 5,300 acres or 12 percent of the visual resource management Class II, and 1,100 acres or 2 percent of Class III. Certain types of rights-of-way placed in the corridor would not comply with the visual standards of these classes. Impacts would, however, be minimized by consolidating land disturbing activities to designated corridors. This would prevent the proliferation of construction scars and man-made intrusions due to random crisscrossing of the landscape. Ten percent of potential oil shale lease areas include Class II visual resources and development within this area would conflict with the visual standards. Development would create unacceptable contrasts with the natural environment.

Increased access from new roads built as a result of energy development would result in greater hunting pressures.

Impacts to the Book Cliffs Natural Area would be the same as were discussed under the Current Management Alternative.



## CHAP. 4 - BALANCED USE ALTERNATIVE

### FIRE MANAGEMENT

#### BLM Impacts

Full suppression of wildfire would protect approximately 84,500 acres throughout the BCRA, safeguard private property, and prevent the spread of wildfire to non-Federal lands.

Over the next 10 years, approximately 17,000 to 27,900 acres would be prescribed burned and provide additional forage for both livestock and wildlife (see discussion under Resource Protection Alternative).

Modified suppression would be utilized on approximately 967,600 to 978,500 acres. Modified suppression would result in impacts as discussed under the Resource Protection Alternative.

### WATERSHED

#### Water Use

##### BLM Impacts

Development of two to four additional oil shale tracts would require 28,000 to 56,000 acre-feet of water per year. Those figures amount to 6 to 12 percent of the average annual flow of the White River. Less water would be required if in situ or modified in situ techniques are employed.

If the water cannot be purchased from other water users with valid rights, development could be delayed or prevented, since the White River is essentially closed to further appropriation.

#### Water Quality

##### BLM Impacts

Less restrictive mineral leasing and ORV travel restrictions on public water reserves and floodplains would lead to a slight, unquantifiable deterioration of water quality.

The Detailed Development Plan for the White River Shale Project assumes no wastewater discharge from tracts U-a and U-b (Bechtel Petroleum, Inc. 1981). Using the same assumption for any additional oil shale leases leads to the conclusion of no impact to water quality. However, the wastewater would contain high concentrations of ammonia, sulfide, phenols, oil and dissolved solids, and has the potential to pollute both groundwater and surface water if any seepage or accidental discharge occurs. Based on depletion information in the UBS Development EIS (BLM 1982b), diverting 28,000 to 56,000 acre-feet per year from the White River would increase total dissolved solids concentrations at the mouth of the White River by 2.6 to 5.2 mg/l, and by 1 to 2 mg/l at Imperial Dam. The increase would be less than 1 percent.

### Soils

#### BLM Impacts

Surface disturbance of 3,800 to 6,600 acres for tar sand recovery, 800 to 1,600 acres for oil shale mining, 1,200 to 3,800 acres for oil and gas production, would increase soil erosion in the BCRA. Reclamation would reduce the average annual disturbance to about 5 to 10 percent of the total. Sediment yields from reclaimed surface mines were 300 to 600 percent higher than for undisturbed sites (Lusby and Toy 1976). In the Piceance Basin in Colorado, estimated increases in sediment yield of 5.8 to 11.6 tons per acre per year during initial construction of oil shale mining sites and 2.9 tons per acre per year after construction were reported (Frickel, et al. 1975). Assuming a tripling of soil loss from disturbed sites in the BCRA, an additional 16,800 to 34,800 tons of soil would be lost in the next 10 years. Although this additional soil loss is less than one percent of the current soil loss from the entire BCRA, localized impacts could be severe, with gully formation in areas with reduced vegetation cover.

Closed and limited ORV travel designations and restrictions on mineral development in severe and critical erosion areas, would reduce soil loss by an unquantifiable amount.

Confining major rights-of-way to 46 miles of corridors totalling 13,400 acres in severe and critical erosion condition would result in fewer acres disturbed and decreased soil erosion.

Constructing up to 3,945 detention-retention dams on 78,900 acres would reduce soil loss by 505,000 tons, over the next 10 years. This is a 3.2 percent reduction from the current erosion rate.

### Floodplains

#### BLM Impacts

Excluding livestock from 470 acres, closing 5,200 acres to ORV use, and allowing no surface occupancy for mineral development, would result in an unquantifiable improvement in floodplain conditions.

### Boulevard Ridge Study Area

#### BLM Impacts

Maintaining the Boulevard Ridge watershed study area would result in additional scientific data. Discontinuing the study area would result in impacts as described in the Commodity Production Alternative.



## CHAP. 4 - BALANCED USE ALTERNATIVE

### LAND TENURE ADJUSTMENT

#### BLM Impacts

Land ownership could change on up to 570 acres available for exchange or sale. Up to 5,800 acres of land could be acquired by BLM, if they become available (Figure 2-7).

No applications or site specific proposals have been received for lands identified for disposal, so an impact analysis is not possible at this time. The lands identified for acquisition are the same riparian and wildlife habitat areas identified in the Resource Protection Alternative plus 140 acres having potential for recreation sites. Their acquisition would protect the important resource values and enhance the BLM's wildlife habitat and recreation management programs. Site specific environmental analyses would be done prior to disposal or acquisition of these lands.

### AIR QUALITY

#### BLM Impacts

The conclusions presented here are based primarily on the analysis of Aerocomp for a 25,000 bpd tar sand scenario in the PR Spring STSA, and the 80,000 bpd analysis by Dietrich, et al. for additional Federal oil shale leasing (Aerocomp 1984, Dietrich, et al. 1983). The impacts from new oil shale leasing at up to 180,000 bpd, were extrapolated by linearly increasing impacts associated with the 80,000 bpd (AP) analysis.

The Class II TSP PSD increments and the 24-hour secondary NAAQS for TSP would be exceeded (Appendix 13, Prevention of Significant Deterioration Regulations and National Ambient Air Quality Standards). Maximum concentrations were predicted to occur in the Book Cliffs State Forest.

Sulfur dioxide impacts would be within PSD increments and the NAAQS. Nitrogen dioxide impacts would also be within the NAAQS; however, visible atmospheric discoloration resulting from emissions of nitrogen oxides could occur at the Uintah and Ouray Indian Reservation and at Dinosaur National Monument.

### SOCIOECONOMICS

The methodologies and computations that were used to estimate economic impacts are discussed in Appendix 12 (Methodology for the Economic and Social Analysis).

#### Economic Conditions

##### BLM Impacts

Oil and gas production and subsequent employment and personal income opportunities would not significantly differ from that analyzed in the Current Management Alternative.

Production from the oil shale and tar sand leases, and therefore, local employment, population growth, infrastructure needs, and fiscal problems would be greater than those identified for the Resource Protection Alternative but less than for the Commodity Production Alternative.

This alternative's assumed BLM production and timing scenario could result in the region having 31,870 more people by the year 1995. Including baseline population projections, Uintah County and the communities and surrounding areas of Roosevelt and Vernal would at some time need to accommodate a greater than 10 percent annual growth rate. The communities of Dinosaur and Rangely would, at some time, need to accommodate a greater than five percent annual growth rate. Population growth would require infrastructural improvements similar to those discussed for the Commodity Production Alternative, but to a lesser degree.

The additional regional infrastructural needs are presented in Table 4-25. These needs can be estimated for each community by comparing the projected population increases of that community (Table 4-26) with the projected population increases of the region (Table 4-25) and applying the resulting proportion to the projected infrastructure needs of the region (Table 4-25).

The fiscal problem and issues related to rapid population growth would be similar to those discussed under the Resource Protection Alternative, except that these problems would be more widespread and of a greater intensity.

In areas where mineral resources overlap (e.g. oil shale, gilsonite, tar sand, oil and gas), the impacts would be the same as were discussed in the Resource Protection Alternative.

Gilsonite, sand and gravel, and miscellaneous mineral activities would continue essentially unchanged from that discussed in the Current Management Alternative.

The management actions under this alternative would affect the amount of public rangeland forage that would be available to livestock operators. This could monetarily affect ranchers and their ability to obtain loans, with some spinoff income and employment effects through the local economy.

Compared to their current forage use, seven cattle operators would have less than a one percent decrease in available forage, resulting in less than a one percent decrease from what they presently earn.

Compared to their current forage use, two sheep operators would have less than a one percent decrease in available forage, resulting in a less than a one percent decrease in their returns above cash cost.

If mineral developments would be concentrated in several allotments rather than spread among all allotments with mineral development potential, as was assumed in the analysis, a total of 14 livestock operators would have less



## CHAP. 4 - BALANCED USE ALTERNATIVE

TABLE 4-25

Balanced Use Alternative  
Summary of Regional Socioeconomic Impacts  
Resulting from BLM Actions

Socioeconomic Development Category	Change From Projected Baseline			
	1985	1990	1995	2000
Population Growth				
Total	-	17,195	31,870	28,000
School Age	-	3,590	7,800	8,131
Employment Growth	-	8,841	14,783	11,561
Household Growth	-	6,052	10,253	7,784
Infrastructure Requirement				
Housing				
Single family	-	3,638	6,132	4,674
Multi-family	-	918	1,540	1,177
Mobile homes	-	1,522	2,561	1,952
Education				
Students	-	3,591	7,880	8,130
Classrooms	-	153	323	331
Teachers	-	153	323	331
Health Care				
Hospital beds				
General care	-	44	73	62
Long-term care	-	21	35	42
Medical personnel				
Doctors	-	21	31	25
Dentists	-	21	26	23
Nurses	-	38	61	54
Public health nurses	-	17	19	15
Medical health care				
Clinical psychologists	-	17	16	14
Mental health workers	-	17	16	14
Public Safety				
Law Enforcement				
Police officers	-	21	35	62
Patrol cars	-	21	35	62
Jail space (sq. ft.)	-	8,605	15,939	14,005
Juvenile holding cells	-	17	16	15
Fire Protection				
Fire flow (gpm)/ duration (hr)				
Emergency Medical Services				
Ambulances	-	9	19	15
Emergency medical technicians	-	116	132	108



## CHAP. 4 - BALANCED USE ALTERNATIVE

TABLE 4-25 (Continued)

Balanced Use Alternative  
Summary of Regional Socioeconomic Impacts  
Resulting from BLM Actions

Socioeconomic Development Category	Change From Projected Baseline			
	1985	1990	1995	2000
Utility Service Demands				
Water System				
Connections	-	5,554	10,293	9,041
Supply (10 <sup>6</sup> gal/yr.)	-	3,244	6,010	5,280
Storage (10 <sup>6</sup> gal/yr.)	-	1,621	3,006	2,640
Treatment (10 <sup>6</sup> gal/yr.)	-	3,244	6,010	5,280
Sewage System (10 <sup>6</sup> gal/yr.)	-	625	1,163	1,022
Solid Waste <sup>a</sup>				

Source: BLM 1983h.

<sup>c</sup>Fire protection measured in fire flow (gpm)/duration (hr) cannot be aggregated across the affected counties.

<sup>d</sup>The State of Utah community facility guidelines do not include a solid waste standard. Therefore, an estimate of solid waste disposal impacts could not be determined.



Table 4-26

Population Projections  
for  
Balanced Use Alternative

Area	1982			1985			1990			1995			2000		
	Base	Base	BLM	Other	Base	BLM	Other	Base	Other	Base	BLM	Other	Base	BLM	Other
Duchesne	15,273	17,778	0	4,965	18,632	2,049	10,226	18,684	13,082	18,929	3,296	13,082	18,929	3,296	15,723
Roosevelt CCD	11,827	13,695	0	348	15,057	2,029	3,019	15,005	3,122	14,636	3,263	3,122	14,636	3,263	3,799
Roosevelt	4,678	5,416	0	244	5,955	1,414	2,057	5,934	2,106	5,789	2,274	2,106	5,789	2,274	2,599
Myton	609	705	0	12	775	61	103	773	99	754	99	105	754	99	130
Other	6,540	7,514	0	92	8,327	554	859	8,298	911	8,093	890	911	8,093	890	1,070
Other	3,446	10,204	0	4,617	3,575	20	7,207	3,679	33	4,293	33	9,960	4,293	33	11,924
Uintah	24,170	25,730	0	18,940	29,326	13,942	35,679	29,863	45,196	28,985	22,425	45,196	28,985	22,425	53,500
Uintah-Ouray	4,737	5,061	0	40	5,699	418	726	5,730	698	5,565	449	698	5,565	449	757
Ballard	678	775	0	20	966	139	315	976	224	926	224	297	926	224	619
Other	4,059	4,286	0	20	4,733	279	411	4,754	225	4,639	225	401	4,639	225	138
Vernal	19,417	20,653	0	1,413	23,611	10,038	10,242	24,117	12,154	23,404	21,752	12,154	23,404	21,752	14,755
Vernal	8,549	9,291	0	565	11,065	4,461	4,148	11,369	9,642	10,941	9,867	4,912	10,941	9,867	5,972
Other	10,868	11,362	0	848	12,546	5,577	6,094	11,389	7,242	12,463	11,885	7,242	12,463	11,885	8,783
Bonanza	16	16	0	178	16	3,486	1,575	16	0	16	224	0	16	224	0
Moffat-Rio Blanco	23,934	24,355	0	146	28,345	488	1,738	27,646	2,016	28,144	785	2,016	28,144	785	2,403
Dinosaur	451	501	0	64	405	215	810	425	943	437	440	943	437	440	1,124
Rangely	3,235	3,193	0	82	3,993	273	928	3,805	1,073	3,962	335	1,073	3,962	335	1,279
Grand	8,100	9,850	21	691	10,570	522	834	10,324	915	9,676	1,494	915	9,676	1,494	919
Thompson		380	21	691	366	522	834	366	915	365	1,494	915	365	1,494	919
Westwater		38	21	691		522	834		915		1,494	915		1,494	919
Mesa			8			194			1,448		580				

CCD: Census County Division



## CHAP. 4 - BALANCED USE ALTERNATIVE

than a one percent decrease in available forage, still resulting in a less than one percent decrease in returns above cash cost.

The number of livestock operators affected to varying degree is shown in Table 4-27.

Any decrease from active preference could impact an operator's wealth. Under this alternative, total long-term grazing privileges could be decreased by 36,028 AUMs from active preference. At a market value of \$60 per AUM for BLM grazing permits, total operator wealth could decline by as much as 2,161,680, a seven percent decrease in their base property value (Appendix 12, Methodology for the Economic and Social Analysis). Although this would be a significant impact on total ranch value, it would not impact an operator's current income or ability to repay loans because current use would not be affected (Table 4-27).

By 1995, BLM wildlife management actions could increase big game numbers, resulting in increased hunter days of 5,310 and increased revenues to the local economy of \$238,950. This increase could be 78 percent higher than present levels.

As populations increase due to oil shale development, recreation use would increase by 4,700 days by the year 1995. The increase would result in additional revenues to the local economy of \$211,500. This increase would be 65 percent higher than present levels.

### Social Conditions

The social effects resulting from the projected population increases would be similar to those that would arise with the Resource Protection Alternative. The effects would be more intense and widespread than in the Resource Protection Alternative, but somewhat less than the Commodity Production Alternative. The difference would be in degree, not in the type of impact.

## TRANSPORTATION

### BLM Impacts

By 1995, BLM actions would increase traffic volumes on the four major highways in the area by 13 percent (refer to Table 4-18). Highway levels of service could be reduced, but by an unknown amount. Operating speeds could drop, an unquantifiable increase in the number of accidents would occur, and an undetermined amount of road deterioration would occur.

## UNAVOIDABLE ADVERSE IMPACTS

Development of mineral resources such as oil and gas, tar sand, and oil shale causes surface disturbance and a modification of topography. Such disturbances can adversely affect other surface uses and resources. Approxi-

mately five percent (700 acres) of the area disturbed by mineral development would be used for production sites and facilities. These areas would be lost for forage production.

Wildlife habitats and population levels would increase under this alternative, but not to the degree available under the Resource Protection Alternative. With this alternative, wild horses would be removed from the Bonanza and Winter Ridge herd locations and managed only at the Hill Creek herd location. Additional adverse impacts under this alternative would be the same as previously discussed under the Current Management Alternative.

Obtrusive developments, such as power and communication lines, within the designated corridors would not comply with visual resource management Class II and Class III designations. The amount of noncompliance cannot be quantified until applications are processed.

Due to tar sand and oil shale development, insufficient water flows could preclude floatboating during midsummer to late fall on the White River. The White River would be depleted of 28,000 to 56,000 acre-feet of water annually. Salinity would increase by 2.6 to 5.2 mg/l at the mouth of the White River and by 1 to 2 mg/l at Imperial Dam.

An additional 16,800 to 34,800 tons of soil would be lost as a result of mineral development.

Even with mitigating measures, TSP standards could be exceeded, especially near the surface tar sand mines. Atmospheric discoloration could be visible near synthetic fuel facilities and power plants, at the Uintah and Ouray Indian Reservation, and at Dinosaur National Monument.

## IRREVERSIBLE OR IRRETRIEVABLE COMMITMENTS OF RESOURCES

Based on present technology, minerals mined and subsequently consumed, or left underground as unrecoverable, would be irretrievably lost. Tar sand strip mining could permanently alter the site potential on approximately 330 acres. The changes would be irreversible.

The salinity increase would be irretrievable for the duration of the water depletion from the White River.

Soils lost to surface disturbing activities would be an irretrievable loss.

Some degradation of air quality would be irreversible, due to established urbanization which would remain in the area after closure of the oil shale and tar sand facilities.

A decision to select this alternative would call for conversion of additional non-Federal agricultural lands to support urban development. This would lock people into an expanding social system that in many ways would be irreversible. This, in turn, would probably solidify a differing lifestyle for area residents.



## CHAP. 4 - BALANCED USE ALTERNATIVE

TABLE 4-27

Number of Operators Affected Under the Proposed  
Plan and Degree of Impact

	Percent Increase From Existing Use and Revenues			Not Affected	Percent Decrease From Existing Use and Revenues		
	50-100	11-50	1-10		1-10	11-50	51-100
Public Rangeland Forage				30	9		
Operator Returns Above Cash Cost				30	9		

Note: Changes are based on average use over the past 3 years.



## CHAP. 4 - BALANCED USE ALTERNATIVE

### SHORT-TERM USE VERSUS LONG-TERM PRODUCTIVITY

Because of the number and amount of minerals considered unrecoverable with present mining technology and practices, loss of mineral production could occur in the long term to achieve short-term minerals production.

In areas where grazing has resulted in poor ecological condition, the loss of topsoil or source of seed for perennial plants, would reduce the long-term productivity of the range.

Use of proper burning techniques would result in a short-term loss of forage in a treated area of one to three years. The long-term productivity of the area can be increased by up to three times the annual production. Chemical treatments and clear cutting would have similar short-term losses for long-term gains of forage. A total of 19,250 acres would be treated using these methods, resulting in an additional 2,000 AUMs of forage within the BCRA.

Decreasing livestock use by 36,028 AUMs and deferring spring grazing in the short term would result in a long-term improvement in ecological condition in riparian areas, floodplains, and the overall range. Although a short-term loss of forage and habitat would occur as a result of forage and habitat improvement projects, a long-term forage and habitat benefit would occur.

Mineral development could result in the long-term elimination of forage and habitat. The duration of the impacts would depend on the amount of annual precipitation and the degree of reclamation success. Reclamation could take up to 30 years, especially in areas which receive less than 10 inches of precipitation annually.

Productive woodlands lost to in situ oil shale development could amount to 590 acres and 4,300 acres could be lost to tar sand development. Wildfires occurring in pinyon/juniper stands would stop regeneration and destroy the seed source. Reestablishment of stands would be delayed 40 to 80 years. Depending on the size of the burn, the allowable cut would be reduced. Less pinyon and juniper firewood would be available for firewood cutters. Harvest of firewood would increase long-term forage production for livestock and wildlife.

Visual quality would be diminished in areas developed for tar sand and oil shale. However, after the extraction of the mineral and completion of the reclamation, evidence of the past minerals extraction activity should be reduced.

The 28,000 to 56,000 acre-feet of water used to develop two to four additional oil shale tracts would not be available for other uses until oil shale developments are terminated.

A long-term, undetermined improvement of riparian areas and floodplains would result from short-term closure of 5,200 acres to ORV use and limiting grazing on 470 acres.

An unquantifiable amount of soil would be lost during the construction of detention-retention dams; however, their construction would reduce further soil loss by 505,000 tons over the next 10 years.

The PSD increments would be available for other projects after completion of the oil shale and tar sand development.

### CUMULATIVE SUMMARY

Direct cumulative impacts on minerals would generally be the same as were discussed under the BLM Impacts for this alternative. However, it should be noted that while air quality permits and water supplies would be available for this level of tar sand and oil shale development if considered separately from interrelated projects, when considered cumulatively, air quality permits and sufficient water supplies may not be available.

Livestock forage use would be decreased by 93 AUMs or 0.1 percent of current use. The level of use would be 36,028 AUMs (35 percent) below active preference. These decreases would affect operating flexibility of the permittees (refer to the socioeconomic discussion of this section). Wildlife use would increase by approximately 3,958 AUMs above the allocated use, an increase of approximately 9 percent above the previous forage levels given to wildlife, and 257 percent of the average (current) use. The Book Cliffs deer and elk herds would be significantly increased.

BLM actions would result in an improvement in ecological condition in 38 allotments and a static condition in 16 allotments. No declines in ecological condition would occur on an allotment basis. Approximately 846,900 acres would improve in ecological condition and 268,500 acres would remain in static ecological condition. The net improvement in ecological condition class would be a change of approximately four percent, from fair to good.

An estimated 1,858 AUMs would be lost due to mineral developments. Land treatments would add an estimated 2,034 AUMs of forage.

A total of approximately 30,000 AUMs of forage would remain unused annually. Plant vigor would improve and ecological condition would gradually improve. In areas receiving less than 10 inches of rainfall annually, improvement would be extremely slow, requiring 30 or more years.

Wild horses would be authorized 2,340 AUMs, a change from no allocation. This would be a five percent decrease from average (current) use. The Bonanza and Winter Ridge horse herds would be removed; the Hill Creek herd would be the only wild horse herd in the BCRA.

Cumulative impacts of interrelated projects (-910 AUMs) and BLM actions (-93 AUMs) would result in a decrease of 1003 AUMs from average livestock use. This decrease would be 36,938 AUMs below active preference.

Oblusive development within the designated utility and transportation corridors would not comply with visual resource management Class II and Class III areas. The amount of noncompliance cannot be quantified until applications are processed.

By 1995, the cumulative demand for firewood could reach 8,100 cords per year. Firewood demand would exceed the



## CHAP. 4 - BALANCED USE ALTERNATIVE

annual allowable cut by 3,830 cords annually. The BLM would not be able to supply fuelwood for slightly less than half of the people seeking it.

With the increasing population in the Uintah Basin as well as the number of big game, hunting opportunities could expand from 6,770 visitor days in 1982 to 15,020 visitor days in 1995. This would be a total increase of 8,250 visitor days, or 122 percent. The quality of hunting would be expected to remain about the same because the increase in big game animals and hunters would be proportional. Demand for all other forms of recreation, except big game hunting, would expand from the current level of 7,200 to 23,400 visitor days, or an increase of 16,200.

Sufficient undeveloped areas would be available to accommodate the increase in dispersed outdoor recreation activities such as sightseeing, camping, and river floating. Other activities requiring developed facilities would be available on adjacent State and Forest Service lands.

Cumulative water depletions would increase by 195,000 to 223,000 acre-feet per year or 42 to 48 percent of the average annual flow of the White River. This exceeds by 86,000 to 114,000 acre-feet the capacity of the White River Reservoir.

The cumulative increase in total dissolved solids concentration at Imperial Dam resulting from other projects and BLM actions would be 6 to 7 mg/l. This represents less than a one percent increase.

Total impacts on soil and floodplains would be the same as discussed for BLM actions.

Land ownership could change on up to 570 acres available for exchange or sale. Up to 5,800 acres of land could be acquired by BLM, if they become available (Figure 2-7).

Cumulative impacts to air quality for this alternative would likely exceed Class II TSP standards at Dinosaur National Monument; the Uintah and Ouray Indian Reservation; Vernal, Utah; and Rangely, Colorado. Yellow-brown atmospheric discoloration resulting from emissions of nitrogen oxides from synthetic fuel facilities and power plants would be visible on the Uintah and Ouray Indian Reservation, at Dinosaur National Monument, and near the facilities and plants. Significant, localized cumulative impacts are possible, if synfuels facilities associated with new leasing are located close to interrelated projects.

Population projections for Uintah and Duchesne Counties and the communities of Roosevelt, Ballard, Vernal, Dinosaur, and Rangely show a need to accommodate a greater than 10 percent annual growth rate. The community of Myton would grow at a rate greater than five percent.

Cumulative impacts on infrastructure needs for the Balanced Use Alternative are summarized in Table 4-28.

The cumulative transportation impacts of the baseline, interrelated projects, and BLM actions are displayed in Table 4-19. All highways, except County Road 262, would provide an unsatisfactory level of service.



## CHAP. 4 - BALANCED USE ALTERNATIVE

TABLE 4-28

Balanced Use Alternative  
Cumulative Infrastructure Needs  
BIM and Interrelated Projects

Socioeconomic Development Category	1985	1990	1995	2000
Population Growth				
Total	27,282	66,463	94,860	102,977
School Age	4,619	12,862	23,845	38,606
Employment Growth	15,817	34,432	42,986	43,614
Household Growth	8,264	21,234	28,623	28,945
Infrastructure Requirement				
Housing				
Single family	4,958	8,596	17,154	17,371
Multi-family	1,239	3,195	4,296	4,352
Mobile homes	2,066	5,319	7,154	7,243
Education				
Students	4,619	12,863	23,925	31,295
Classrooms	185	523	964	1,258
Teachers	185	523	964	1,258
Health Care				
Hospital beds				
General care	59	141	198	212
Long-term care	12	51	85	99
Medical personnel				
Doctors	16	51	68	70
Dentists	14	45	57	61
Nurses	46	122	167	180
Public health nurses	6	27	33	31
Medical health care				
Clinical psychologists	3	21	20	19
Mental health workers	4	23	22	23
Public Safety				
Law Enforcement				
Police officers	54	119	160	212
Patrol cars	54	119	160	212
Jail space (sq. ft.)	13,592	33,281	47,166	51,360
Juvenile holding cells	5	24	25	25
Fire Protection				
Fire flow (gpm)/ duration (hr)				
Emergency Medical Services				
Ambulances	6	19	33	31
Emergency medical technicians	38	184	227	218



## CHAP. 4 - BALANCED USE ALTERNATIVE

TABLE 4-28 (Continued)

Balanced Use Alternative  
Cumulative Infrastructure Needs  
BLM and Interrelated Projects

Socioeconomic Development Category	1985	1990	1995	2000
Utility Service Demands				
Water System				
Connections	8,769	21,399	30,441	33,143
Supply (10 <sup>6</sup> gal/yr.)	5,121	12,498	17,777	19,355
Storage (10 <sup>6</sup> gal/yr.)	2,561	6,248	8,890	9,677
Treatment (10 <sup>6</sup> gal/yr.)	5,121	12,498	17,777	19,355
Sewage System (10 <sup>6</sup> gal/yr.)	992	2,417	3,443	3,749
Solid Waste <sup>a</sup>				

Source: BLM 1983h.

<sup>c</sup>Fire protection measured in fire flow (gpm)/duration (hr) cannot be aggregated across the affected counties.

<sup>d</sup>The State of Utah community facility guidelines do not include a solid waste standard. Therefore, an estimate of solid waste disposal impacts could not be determined.



# List of Abbreviations

<b>ACEC</b>	-Area of Critical Environmental Concern	<b>MOU</b>	-Memorandum of Understanding
<b>ADT</b>	-Additional Daily Traffic	<b>NAAQS</b>	-National Ambient Air Quality Standards
<b>AMP</b>	-Allotment Management Plan	<b>NPS</b>	-National Park Service
<b>AUM</b>	-Animal Unit Month	<b>NOSR II</b>	-Naval Oil Shale Reserve II
<b>BACT</b>	-Best Available Control Technology	<b>ORV</b>	-Off-Road Vehicle
<b>bb1</b>	-billion barrels	<b>PJ</b>	-Pinyon-Juniper
<b>bpd</b>	-barrels per day	<b>PSD</b>	-Prevention of Significant Deterioration
<b>BCRA</b>	-Book Cliffs Resource Area	<b>RMOGA</b>	-Rocky Mountain Oil and Gas Association
<b>BLM</b>	-Bureau of Land Management, U.S. Department of the Interior	<b>RMP</b>	-Resource Management Plan
<b>CCD</b>	-County Census Division	<b>SHPO</b>	-State Historical Preservation Office
<b>CEQ</b>	-Council of Environmental Quality	<b>SLBM</b>	-Salt Lake Base and Meridian
<b>CFR</b>	-Code of Federal Regulations	<b>STSA</b>	-Special Tar Sand Area
<b>CHL</b>	-Combined Hydrocarbon Leases	<b>TDS</b>	-Total Dissolved Solids
<b>cy</b>	-calendar year	<b>TSP</b>	-Total Suspended Particulate Mass
<b>DOE</b>	-Department of Energy	<b>UBS</b>	-Uintah Basin Synfuels; references EIS produced by BLM in 1983
<b>EIS</b>	-Environmental Impact Statement	<b>UDWR</b>	-Utah Division of Wildlife Resources
<b>FS</b>	-Forest Service, U.S. Department of Agriculture	<b>UGMS</b>	-Utah Geological and Mineral Survey
<b>FWS</b>	-Fish and Wildlife Service, U.S. Department of the Interior	<b>VRM</b>	-Visual Resource Management
<b>KGS</b>	-Known Geologic Structure	<b>WRDP</b>	-White River Dam Project
<b>KOSLA</b>	-Known Oil Shale Lease Areas	<b>WRSOC</b>	-White River Shale Oil Corporation
<b>MFP</b>	-Management Framework Plan	<b>WSA</b>	-Wilderness Study Area







# Glossary

**ACTIVE GRAZING PREFERENCE**-The total number of AUMs that could be currently licensed.

**ALLOTMENT**-An area of land designated and managed for grazing of livestock.

**ALLOTMENT CATEGORIZATION**-The grouping of livestock grazing allotments into one of the following: maintain (M) current satisfactory condition, improve (I) current unsatisfactory condition, and manage custodially (C) while protecting existing resource values. The criteria used to determine the categorization are: range condition, resource potential, presence of resource use conflicts or controversy, opportunity for positive economic return, the present management situation and other criteria as appropriate.

**ALLOTMENT EVALUATION PROGRAM**-An ongoing program set up to periodically evaluate resource conditions, management practices, and facilities for a particular allotment. The evaluation includes a comparison of actual use data with utilization studies, an evaluation of trend and other special studies data along with climatological data. It may also include range inspection tours by BLM and affected users to jointly evaluate on-the-ground conditions. The frequency and intensity of evaluation will depend on the level of resource values and use conflicts occurring in the allotment e.g. "I" category allotments would receive more frequent and intense monitoring and evaluation than "C" category allotments (see Allotment Categorization).

**ALLOTMENT MANAGEMENT PLAN**-A documented program which applies to livestock operations on the public lands; prepared in consultation, cooperation, and coordination with the permittee(s), lessee(s), or other affected interests.

**ALLOWABLE CUT**-Amount of wood permitted to be harvested within a given time period.

**ALLUVIUM**-Unconsolidated rock or soil material deposited by running water, including gravel, sand, silt, clay, and various mixtures of the same.

**AMBIENT AIR QUALITY**-Prevailing condition of the atmosphere at a given time; the outside air. All lands are categorized in one of the Prevention of Significant Deterioration (PSD) classes. Class I is the most restrictive and generally applies to specific national parks and monuments. No decrease in air quality is allowed under this class. Class II areas allow some decrease in air quality. Class III areas allow for a substantial decrease in air quality, such as is found in urban areas.

**ANIMAL UNIT MONTH (AUM)**-The amount of forage necessary to sustain one cow, one horse, or five sheep for one month. Wildlife Ratio: Forage necessary to sustain 9.6 antelope, 5.8 deer, or 1.9 elk for one month.

**AQUIFER**-A water bearing bed or stratum of permeable rock, sand, or gravel capable of yielding considerable quantities of water.

**AREA OF CRITICAL ENVIRONMENTAL CONCERN (ACEC)**-An area of public lands where special management attention is required to protect and prevent irreparable damage to important historic, cultural, or scenic values; fish and wildlife resources; or other natural systems or processes, or to protect life or provide safety from natural hazards.

**AVERAGE LIVESTOCK USE**-The average livestock grazing use of 3 representative years from 1975-1982.

**BITUMEN**-A naturally occurring semi-solid mixture of hydrocarbons that, in their naturally occurring state, can not be recovered at a commercial rate by conventional primary and secondary oil and gas recovery methods.

**BLOCKING**-A process of consolidating or making isolated land tracts contiguous through selling or exchanging with other land holders, both public and private.

**BROWSE**-That part of the current leaf and twig growth of shrubs, woody vines, and trees available for animal consumption.

**CATEGORIES (LEASING)**-The four categories used to determine leasing activities for oil and gas and tar sand were based on potential for development, other resource uses, and protection of sensitive resource values. Category 1 opens all public lands to leasing with standard stipulations. Category 2 allows leasing with standard and special stipulations to protect sensitive resource values. Category 3 allows leasing with no right of surface occupancy: recovery methods must not disturb the surface; and Category 4 closes lands to leasing.

**CLOSED**-Designated areas and trails where the use of off-road vehicles are permanently or temporarily prohibited. Use of emergency vehicles is allowed.

**COMBINED HYDROCARBON LEASE (CHL)**-A lease issued in a Special Tar Sand Area (STSA) which entitles the lessee to remove any gas and nongaseous hydrocarbon substance other than coal, oil shale, or gilsonite.

**CORD**-A unit of measure of wood volume; it is the amount of cut logs or wood in a stack measuring 4 by 4 by 8 feet.

**CORRIDOR**-A strip of land (usually a few to many times the width of a right-of-way) within which one or more existing or potential facilities may be located.

**CRUCIAL RANGE**-Range on which a species depends for survival; there are not alternative ranges available due to climate conditions or other limiting factors. May also be called key range.

**CULTURAL RESOURCES**-Those fragile and nonrenewable remains of human activity, occupation, or endeavor reflected in districts, sites, structures, buildings, objects, artifacts, ruins, works of art, architecture, and natural features that were of importance in human events. These resources consist of (1) physical remains, (2) areas where significant human events occurred—even though evidence of the event no longer remains, and (3) the environment immediately surrounding the resource.

**CULTURAL RESOURCE INVENTORY**-A descriptive listing and documentation, including photographs and maps, of cultural resources; included are the processes of locating, identifying, and recording sites, structures, building, objects, and districts through library and archival research, information from persons knowledgeable about cultural resources, and varying levels of intensity of on-the-ground field surveys.

**CULTURAL RESOURCE SITE**-A physical location of past human activities or events. Cultural resource sites are extremely variable in size and range from the location of a single cultural resource object to a cluster of cultural resource structures with associated objects and features. Prehistoric and historic sites which are recorded as cultural resources have sociocultural or scientific values and meet the general criterion of being more than 50 years old.

**DESIGNATED CORRIDOR**-A linear area of land with legally defined and recognized boundaries and capacities having ecological, technical, economic, social, or similar advantages over other areas for the present or future location of transportation or utility rights-of-way, and which have been identified and designated by legal public notice.

**DIRECTIONAL DRILLING**-Slant drilling or drilling on an angle. Directional drilling is utilized when the operator is not allowed to occupy the surface of a given tract of land, but still wishes to drill a structure or target beneath that tract.



## GLOSSARY

**DISPOSAL AREA**-A parcel of public land that could pass from government ownership through sales or exchanges or both. Some land may be retained in public ownership based on site-specific criteria.

**ECOLOGIC CONDITION**-The present state of vegetation of an ecologic site in relation to the climax (natural potential) plant community for that site. It is an expression of the relative degree to which the kinds, proportions, and amounts of plants in a plant community resemble that of the climax plant community for the site. Ecological condition is rated as follows: excellent-more than 75 percent of the climax vegetation, good-51 to 75 percent of the climax vegetation, fair 26 to 50 percent of the climax vegetation, poor-less than 26 percent of the climax vegetation.

**ECOLOGIC SITE**-A distinctive geographic unit that differs from other kinds of geographic units in its ability to produce a characteristic natural plant community. An ecologic site is the product of all the environmental factors responsible for its development. It is capable of supporting a native plant community typified by an association of species that differs from that of other ecologic sites in the kind or proportion of species or in total production.

**EDGE EFFECT**-The phenomenon that occurs when two or more habitat types come together and create more favorable wildlife habitat than either type could provide alone.

**EXCLUSION AREAS**-Land areas determined to be unavailable for corridor allocation or facility siting for reasons of unsuitability, legislative classification or allocation to uses incompatible with facility siting.

**EXTENSIVE RECREATION MANAGEMENT AREA**-Areas of limited recreation opportunities and where intensive recreation management is not required. Minimal recreation management actions are adequate in these areas.

**FEDERAL LANDS**-Lands owned by the United States, without reference to how the lands were acquired or what Federal agency administers the lands, including mineral estates underlying private surface.

**FIRE MANAGEMENT**-The use of full suppression, modified suppression, and prescribed fire to achieve desired management objectives.

**FIRE MANAGEMENT PLAN**-A source document containing fire history, ecological impacts, and proposed fire actions for manageable units of public lands.

**FIVE YEAR MONITORING PERIOD**-See MONITORING.

**FLOODPLAIN**-The nearly level alluvial plain that borders a stream and is subject to inundation (flooding) during high water.

**FORAGE**-All browse and herbaceous foods that are available to grazing animals. It may be grazed or harvested for feeding.

**FORAGE MONITORING**-An ongoing program designed to measure changes in plant composition, ground cover, animal populations, and climatic conditions on the public rangeland. Vegetation studies are used to monitor changes in rangeland condition and determine the reason for any changes that are occurring. The vegetation studies consider actual use, utilization, trend, and climatic conditions.

**FORAGE POTENTIAL**-The optimum amount (lbs/acre) of forage that could be produced in a grazing allotment that is stable, self-perpetuating and in equilibrium with its physical habitat.

**FULL GRAZING PREFERENCE**-The total number (active and suspended nonuse) of animal unit months of livestock grazing on public land apportioned and attached to base property owned or controlled by a permittee.

**FULL SUPPRESSION**-Taking aggressive action on all fires on or threatening the public lands, with sufficient forces to contain the fire during the early burning period.

**GRAZING SYSTEM**-A systematic sequence of grazing treatments applied to an allotment to reach identified multiple-use goals or objectives by improving the quality and quantity of vegetation.

**GRAZING TREATMENT**-A prescription under a grazing system which grazes or rests a unit of land at particular times each year to attain specific vegetation goals.

**HABITAT**-The place where animals or plants normally live, often characterized by a dominant plant and co-dominant form (pinyon-juniper habitat).

**HYDROCARBONS**-Organic chemical compounds of hydrogen and carbon atoms which form the basis of all petroleum products.

**IN LIEU SELECTION**-A process by which the State of Utah (and other public land states) may select Federal lands within its boundaries because of Federal appropriation of grant lands before title could pass to the State. The State is entitled to select acreage equal to the amount that was appropriated.

**IN SITU**-In place; in the original location.

**IN SITU EXTRACTION**-Extracting the oil from tar sand or oil shale while it is still in place by injecting steam, solvents, and/or heat.

**KEY AREA (Forage)**-An area that receives at least moderate use, has the productive capability to respond to management and is important from a forage standpoint.

**KEROGEN**-The organic, oil-yielding material present in oil shale. Kerogen is not a definite compound but a complex mixture varying from one shale to another. When heated to above 900°F, kerogen decomposes to yield a liquid oil, light gases, and a solid residue.

**KNOWN GEOLOGIC STRUCTURE (KGS)**-Geologic strata known to contain oil or gas because it has been penetrated by a producing or producible oil or gas well.

**LEASABLE MINERALS**-Minerals such as coal, oil shale, oil and gas, phosphate, potash, sodium, geothermal resources, and all other minerals that may be acquired under the Mineral Leasing Act of 1920, as amended.

**LEASE**-A document through which interests are transferred from one party to another, subject to certain obligations and considerations.

**LEASE (MINERAL)**-A contract between a landowner and another, granting the latter the right to search for and produce gas, hydrocarbons, or other mineral substances upon payment of an agreed-upon rental.

**LEASE CONVERSION**-The process of converting an existing oil and gas lease in a Special Tar Sand Area (STSA) to a Combined Hydrocarbon Lease (CHL). The conversion is completed through approval of a plan of operation outlining how the hydrocarbon resource will be developed.

**LIMITED**-Designated areas and trails where the use of off-road vehicles is subject to restrictions, such as limiting the number or types of vehicles allowed, dates, and times of use; limiting use to existing roads and trails; or limiting use to designated roads and trails.

**LOCATABLE MINERALS**-Minerals that may be acquired under the Mining Law of 1872, as amended.

**LONG-TERM**-A period of time in excess of ten years.

**MITIGATION MEASURES**-Actions which could be taken to lessen the adverse effects of proposed project development upon existing resources.

**MODIFIED IN SITU RETORTING**-A process in which a portion of the oil shale deposit is removed from underground and the remaining oil shale is fractured to create a highly permeable zone to allow passage of air and fire to heat the kerogen and release the shale oil.



## GLOSSARY

**MODIFIED SUPPRESSION**-A deviation from normal fire suppression which is based on a fire land use decision, or where controlling fire is extremely difficult, or where the values-at-risk, do not warrant the expense associated with normal suppression procedures.

**MONITORING (Vegetation Soils)**-An ongoing program designed to determine the effect of management practices, relative to livestock, wildlife and wild horse use on the soil and vegetative resource. The studies include actual use, utilization, trend, climatological, and other special vegetative analysis. The studies are evaluated periodically as a part of the "Allotment Evaluation Program". Adjustments in management practices (stocking levels, animal numbers, seasons of use, grazing systems, etc.) are made as a result of the monitoring and evaluation program. Note: Current range policy (WO IM 94-135) requires that a Five Year Monitoring Period be established following completion of the EIS to serve as a base for arriving at a proper stocking level.

**MULTIPLE-USE MANAGEMENT**-The management of public lands and their various resource values so that they are utilized in the combination that will best meet the needs of the people.

**NONIMPAIRMENT CRITERIA**-A series of guidelines which govern surface disturbing activities on lands being studied by BLM for inclusion in the National Wilderness Preservation System. The guidelines require that lands be managed so as to not impair their suitability for designation as wilderness. Any authorized activities must be temporary in nature and not degrade the area's wilderness values. Disturbed areas must be capable of being reclaimed so that they are substantially unnoticeable by the time the Secretary of the Interior makes his recommendation on Wilderness Areas to the President.

**OFF-ROAD VEHICLE (ORV)**-Any motorized vehicle capable of or designed for travel on or immediately over land, water, or other natural terrain.

**OIL**-All nongaseous hydrocarbon substances other than those substances leaseable as coal, oil shale, or gilsonite (including all vein-type solid hydrocarbons).

**OIL SHALE**-A layered sedimentary rock which contains abundant quantities of an organic material known as kerogen. When heated above 900°F, the kerogen in the rock decomposes, releasing a liquid oil product, shale oil.

**OPEN**-Designated areas and trails where off-road vehicles may be operated without restriction.

**OUTCROPS (TAR SAND)**-Those parts of a tar sand deposit exposed at the surface.

**OVERBURDEN**-Material of any nature that overlies a deposit of useful materials, such as tar sand or oil shale.

**PALEONTOLOGY**-A science dealing with the life and past geological periods as known from fossil remains.

**POPULATION**-All the individuals belonging to a single plant or animal species occupying a particular area of space.

**PRIOR STABLE POPULATION NUMBERS**-A number of animals, by species (derived from wildlife population dynamics data and long-term observations), previously supported at or near the grazing capacity of the given wildlife herd unit.

**PRIORITY MANAGEMENT AREA**-An area where high quality oil shale deposits exist and oil shale development would generally be acceptable. Oil shale lease tracts would be located within these areas at a future date.

**PUBLIC LAND**-Lands administered by the Bureau of Land Management, vacant, unappropriated, and unreserved lands which have never left Federal ownership; also, lands in Federal ownership which were obtained by the Government in exchange for public lands or for timber on public lands.

**PUBLIC WATER RESERVE**-A parcel of land, usually 40 acres, withdrawn from settlement, mineral location, sale, or entry, containing a spring or water hole which is reserved for public use. Public water reserves were established by Executive Order #107 dated April 17, 1926.

**RECREATION VISITOR DAY**-Recreation use totalling 12 hours by one or more persons.

**RIPARIAN HABITAT, AQUATIC (STREAMSIDE)**-Vegetation communities found in association with streams (both perennial and intermittent), lakes, ponds, and other open water. This unique habitat, comprising less than 1 percent of the land area, is crucial to the continued existence of the fish species known to occur. Stream-side vegetation maintains high water tables, stabilizes streambanks, creates quality fishery habitat, and maintains water quality. It is also essential to most terrestrial wildlife species.

**RIPARIAN HABITAT, TERRESTRIAL**-Vegetation communities found in association with either open water or water close to the surface; includes such habitat features as meadows, aspen stands, and/or other trees and shrubs. This unique habitat is crucial to the continued existence of the majority of the terrestrial wildlife species known to occur. Many species are found nowhere else.

**ROOM-AND-PILLAR MINING**-A process in which some of the oil shale deposit is removed, creating underground rooms. Some of the deposit is left in place in the form of pillars to support the mine roof.

**ROTATION GRAZING SYSTEM**-An intensive system of management where grazing is deferred on various parts of the range during succeeding years.

**SALABLE MINERALS**-Minerals such as common varieties of sand, stone, gravel, and clay that may be acquired under the Materials Act of 1947, as amended.

**SATURATION**-A measure of the extent to which pore space in the sand or rock is occupied by bitumen or oil. Also, the extent to which pore space in soil is occupied by water.

**SCOPING PROCESS**-An early and public process for determining the nature, significance, and range of issues to be addressed related to a proposed action.

**SEASON LONG USE**-Grazing of a management area or range allotment continuously for a specified season or period of time (i.e. November 1 to April 30).

**SEMI-PRIMITIVE-MOTORIZED**-Areas which are accessible by vehicular travel but which remain essentially undeveloped.

**SITE POTENTIAL**-The expression of an ecologic site relative to the climax plant community. It represents the full ability (natural potential) of a particular site as influenced by soils, topography, climate, etc. to produce a certain mix of plants and volume of vegetative matter.

**SPECIAL TAR SAND AREA (STSA)**-An area designated by the Department of the Interior's Orders of November 20, 1980 (45 Federal Register 76800) and January 21, 1981 (46 Federal Register 6077), and referred to in those orders as Designated Tar Sand Areas, as containing substantial deposits of tar and sand. Eleven STSAs are recognized in Utah by the Combined Hydrocarbon Leasing Act of 1981. The Act provided for the conversion of existing oil and gas leases in STSAs to Combined Hydrocarbon Leases (CHLs). This Act also required competitive leasing for currently unleased lands within STSAs.

**SPECIES, CANDIDATE**-An animal or plant which may be designated threatened or endangered in the near future. This status offers no legal protection under the Endangered Species Act of 1973.

**SPECIES, ENDANGERED**-An animal or plant whose prospects of survival and reproduction are in immediate jeopardy, and as is further defined by the Endangered Species Act of 1973, as amended.



## GLOSSARY

**SPECIES, SENSITIVE**-One of two groups of plants or animals: (A) Those which could be appropriate for listing as threatened or endangered, but do not have sufficient data to be used in the listing process. These species need more study; or (B) Those which are not being considered as candidates for the listing process, but are known to be rare, site specific, endemic or in potentially threatened land use areas (the BLM gives sensitive species the same consideration for protection as threatened or endangered species).

**SPECIES, THREATENED** Any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range, and as is further defined by the Endangered Species Act of 1973, as amended.

**SUSTAINED YIELD**-A silvicultural practice in which the volume of wood cut is equal to growth over the long run.

**TAR SAND**-Any consolidated or unconsolidated rock (other than coal, oil shale, or gilsonite) that either: (1) contains a hydrocarbonaceous material with a gas-free viscosity at original reservoir temperature greater than 10,000 centipoise; or (2) contains a hydrocarbonaceous material and is produced by mining or quarrying. Tar sand constitutes one of the largest known nonfluid petroleum resources in the United States. Approximately 90 percent of the United States' tar sand (27 billion barrels) is located in Utah.

**TAR SAND DEPOSIT** A natural bitumen (oil-impregnated) containing or appearing to contain an accumulation of tar sand, separated or appearing to be separated from any other such accumulation.

**TERTIARY**-Of, belonging to, or designating the geologic time, system of rocks, and sedimentary deposits of the first period of the Cenozoic era, extending from the Cretaceous period of the Mesozoic era to the Quaternary period of the Cenozoic era, characterized by the appearance of modern flora and of apes and other large mammals.

**TIMBERLANDS**-Those sites supporting stands composed of Douglas fir, aspen, ponderosa pine, and cottonwood.

**TOTAL SUSPENDED PARTICULATES**-All solid or semi-solid material found in the atmosphere i.e. dust.

**TRACT U-a**-One of two Federal oil shale lease areas in Utah. Each lease area is 5,120 acres in size, and is leased by the White River Shale Oil Corporation, Inc. (see Tract U-b).

**TRACT U-b**-The second of the two Federal oil shale lease areas in Utah. This lease area is the same size and adjacent to the first. This area is also leased by the White River Shale Oil Corporation, Inc. (see Tract U-a).

**TREND** The direction of change in range condition. The factors that influence trend are: changes in plant composition, abundance of young plants, plant residues, plant vigor, and the condition of the soil surface.

**VISUAL RESOURCE MANAGEMENT (VRM)**-The planning, designing, and implementation of management objectives for maintaining scenic value and visual quality on public lands.

**VISUAL RESOURCE MANAGEMENT CLASSES**-The five degrees of acceptable visual change within a characteristic landscape:

**CLASS I**-Areas (preservation) provide for natural ecological changes only. This class includes primitive areas, some natural areas, some wild and scenic rivers, and other similar sites where landscape modification activities should be restricted.

**CLASS II**-(partial retention of the landscape character) includes areas where changes in any of the basic elements (form, line, color, or texture) caused by management activity should not be evident in the characteristic landscape.

**CLASS III**-(partial retention of the landscape character) includes areas where changes in the basic elements (form, line, color, or texture) caused by a management activity may be evident in the characteristic landscape.

**CLASS IV**-(modification of the landscape character) includes areas where changes may subordinate the original composition and character.

**CLASS V**-(rehabilitation or enhancement of the landscape character) includes areas where change is needed to restore the landscape.

**WATERSHED**-A total area of land above a given point on a waterway that contributes runoff water to the flow at that point.

**WILDERNESS CHARACTERISTICS**-Factors identified by Congress in the Wilderness Act of 1964 which should be used to determine the suitability of land for inclusion into the National Wilderness System. They include: size, naturalness, outstanding opportunities for solitude or a primitive and unconfined type of recreation, and supplemental values such as geological, archaeological, historical, ecological, scenic, or other features. It is required that the area possess at least 5,000 acres or more of continuous public land or be of a size to make practical its preservation and use in an unimpaired condition; be substantially natural or generally appear to have been affected primarily by the forces of nature, with the imprint of cultural modifications being substantially unnoticeable; and have either outstanding opportunities for solitude or a primitive and unconfined type of recreation. Congress stated that a wilderness area may also have supplemental values or other features of scientific, educational, scenic, or historical value.

**WILDERNESS STUDY AREA (WSA)**-A roadless area which has been found to have wilderness characteristics.

**WILD HORSES**-All unbranded and unclaimed horses and their progeny that roam public lands, or that use these lands as all or part of their habitat after December 15, 1971.

**WITHDRAWAL**-Actions which restrict the use of public land and segregate the land from the operation of some or all of the public land and/or mineral laws. Withdrawals are also used to transfer jurisdiction of management to other Federal agencies.

**WOODLANDS**-Lands producing tree species that are typically utilized as nonsawtimber products and sold in units other than boardfeet i.e. pinyon and juniper.

**YEAR-LONG USE**-Grazing of a management area or range allotment continuously throughout the year.



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The following symbols are used to help the reader locate copies of the references. The appropriate symbols will appear at the end of each citation.

C-Available for inspection at Bureau of Land Management, Colorado State Office, 1037 20th Street, Denver, Colorado 80202.

E-Available for inspection at Bureau of Land Management, Division of Environmental Impact Statement Services, 555 Zang Street, First Floor East, Denver, Colorado 80228. Copies of some items are available at cost for reproduction.

L-Available through public library loan system.

M-Available for inspection at Bureau of Land Management, Moab District Office, 82 East Dogwood, P.O. Box 970, Moab, Utah 84532.

S-Available for inspection at Bureau of Land Management, Utah State Office, University Club Building, 136 East South Temple, Salt Lake City, Utah 84111.

V-Available for inspection at Bureau of Land Management, Vernal District Office, 170 South 500 East, Vernal, Utah 84078.

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# APPENDIX 1

## CONSULTATION AND COORDINATION

### SUMMARY OF PROJECT SCOPING

An Environmental Impact Statement (EIS) must be prepared when a federal agency considers implementing actions within its jurisdiction that may result in significant impacts to the environment. EISs aid federal officials in making decisions by presenting the environmental facts on a proposed project and its alternatives. The first step in preparing an EIS is to determine the scope of the project and the range of actions, alternatives, and impacts to be included in the document.

The Council on Environmental Quality regulations (40 CFR, Parts 1500-1508) require an early scoping process to determine the significant issues related to the proposed action and alternatives which should be addressed in the EIS. The principal purpose of the scoping process is to identify important issues, concerns, and potential impacts that require detailed analysis in the EIS and to eliminate insignificant issues and alternatives from detailed analysis.

#### Method of Scoping

The scoping process for the Book Cliffs Resource Management Plan (RMP) consisted of Federal Register Notices, public meetings, agency meetings, mailouts for written comments, and informal conversations with interested parties within the affected area.

With the assistance of federal and state agencies, local entities, and private individuals, the significant issues and concerns were identified for analysis in the EIS. Insignificant issues were also identified so that they could be eliminated from the scope of the EIS.

The dates and times for the Book Cliffs RMP public scoping meeting and the availability of background information were publicized within the affected area through the local media. Notification of the meetings was also sent to government organizations and other potentially interested groups within the area.

In the early stages of the project (1980), informative discussions were held with local residents and elected and appointed officials in the project area. As a result of these discussions, preliminary issues were identified, and attendance at the forthcoming public meetings was encouraged.

Representatives of the Vernal District then met with members of local governments to present the preliminary issues for their comments and suggestions.

A brochure requesting public comments on the planning guidelines for the Book Cliffs Resource Area was sent to government organizations, interested groups and concerned citizens in March 1981. Comments received aided the BLM in refining the issues.



Appendix 1 (Continued)

Meeting With Elected and Appointed Officials  
of Uintah County  
April 16, 1980

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Attendees	Representing
Charles Henderson	Energy Director, Uintah Basin Association of Governments
Neil Domgaard	Uintah County Commissioner
Roland Merkley	Uintah County Commissioner
Merrill Mecham	Uintah County Commissioner
Lloyd Ferguson	Vernal District Manager, BLM
Dean Evans	Bookcliffs Area Manager, BLM
Dave Moore	Chief of Planning & Environmental Coordination, Vernal District, BLM
Ralph Brown	Planning Coordinator, Vernal District, BLM

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Summary of Issues:

1. Need for county input, especially on energy, wildlife, and grazing.
2. Need for study on gravel pit sitings.
3. Need for road rights-of-way to be wide enough to handle multiple uses.
4. Need for input from ranchers/miners.
5. Concern with possible revocation of withdrawals.
6. Need for using topographic and ortho-photo quads in establishing Book Cliffs planning needs.

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On February 4, 1983, a letter listing the issues and planning criteria was sent to all organizations, groups, and individuals that had aided in the planning process. The letter asked for additional comments and invited them to attend a scoping meeting to discuss possible management alternatives for the BCRA.

A formal public meeting was conducted in Vernal, Utah on April 5, 1983. Interested individuals, groups, and local agencies were given the opportunity to voice their concerns and raise issues which they felt merited consideration in the alternatives for the EIS. Results from this meeting and responses from requests for written comments were as follows:



Appendix 1 (Continued)

Public Scoping Meeting

Book Cliffs RMP

April 5, 1983

Name	Representing
Robert Fuller	BIA
Glen B. Wells	Utah Power & Light
Ken Parr	Ute Tribe
Jason Cuch	Ute Tribe
Val Sorenson	Self
J. Bowden	Self
Roland McCook	BIA
Neil Donggaard	Uintah County Commission
Laura Chew	Self
Dean Chew	Self
Katherine Smith	ERA-Ashley Valley Realtors
Jon Hill	Atchee Ridge/Book Cliffs Cattlemen
Anthony Rampton	Fabian & Clendenin
Robert Heistand	Paraho Development Corporation
Scott Patterson	Mountain Bell

Name	Representing
Jeff Henderson	Moon Lake Electric Association
John Davis	Self
Tim Blackham	Mountain Fuel Supply Company
Reed Clayson	Synfuel Energy and Development Corporation
Carlin Cuch	Ute Tribe
Ken Harper	U.S. Fish and Wildlife Service
Bob Shaffer	Desert G&T Co.
Leo Snow	Uintah County Commission
Robert Matthews	Moon Lake Electric Association
Byron Merrell	Uintah County Commission
Rex Headd	Mountain Fuel Resources
John Henderson	Mountain Fuel Supply
Rusty Lundberg	Geokinetics
Marvin Jackson	Self
Kevin Scott	Gulf Oil
Charles Cameron	Ute Tribe
Gregg Oaks	Moon Lake Electric Association
Meril Snow	Self
Berne Pulsipher	Mountain Bell



## Appendix 1 (Continued)

### Summary of Comments:

1. Concern that wildlife ranges/populations are unknown.
2. Concern with whether wildhorse herds should be expanded or merely maintained at present levels.
3. Concern about exclusion areas for utilities on private lands.
4. Concern that rights-of-way should be considered outside of designated corridors on case-by-case basis.
5. Concern with movement of elk onto Reservation lands.
6. Designation of areas where building stone may be removed.
7. Concern with future access to service areas by Utah Power and Light/Moon Lake Electric Association.
8. Designation of ORV/dirt bike areas and attendant regulations/controls.
9. Need for identifying location of the existing oil/gas leases in Hill Creek.
10. Concern with access for deer hunters.
11. Concern with utility corridor conflicts/overlaps/planning.
12. Concern with traffic controls/highway protection.
13. Concern with the effects of mineral development on livestock/wildlife.
14. Concern with future use of water/watershed.

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After the alternative scoping meeting was held, the BLM mailed out new project descriptions describing the changes in the project and inviting more public comments regarding the project scope, issues, and concerns. This information was sent to all interested persons as well as all attendees of the public scoping meetings. The following responses were received from this mail-out around May 20, 1983, and were included in determining the alternatives of the EIS.



## Appendix 1 (Continued)

### Comments on Draft Alternatives Book Cliffs RMP

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Name	Representing
<hr/>	
Dorothy Harvey	Intermountain Water Alliance
Lorin Merkley	Self
Peter Hovingh	Self
Clinton Harrison	Self
Lawella Nielson	Self
Ken Husch	Local merchant
Frank Hackler	H&H Firewood Co.
Ron Hardlinger	T&J Yamaha
Mike Adams	Self
Meril Snow	Self
Ernest Chandler	Self
G. Merrell	Self

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#### Summary of Comments:

1. Need for preserving scenic, wildlife, and recreation qualities, especially on the White River Corridor, Green River, Red Wash, and between U.S. 40 and Bonanza Highway.
2. Need for off-road vehicle designation and controls.
3. Need for protection of riparian habitat.
4. Need for firewood cutting/chaining controls.
5. Need for protection/improvement of Musketshot Springs.
6. Concern with control of wild horses.
7. Development of water sources.

#### Results of Scoping

The results of the scoping process along with further input from various federal and state agencies identified the most significant issues associated with the project; these issues have been covered in detail in this EIS.

Issues identified by meeting participants and through written input have been used to determine the scope of the Book Cliffs Resource Area RMP EIS. The



## Appendix 1 (Continued)

extent to which each resource is analyzed was partially determined by the concerns raised in the scoping meetings.

### PUBLIC INVOLVEMENT

In the course of preparing the draft EIS for the Book Cliffs Resource Management Plan, BLM communicated with many federal, state, and local agencies; elected representatives; environmental and citizens groups; industries; and individuals. Many of these people participated in the public scoping meeting which was held in April, 1983. The following agencies have provided input and/or will receive copies of the EIS.

#### Federal Government Agencies

- Department of the Interior
  - Fish and Wildlife Service
  - National Park Service
  - Bureau of Indian Affairs
- Department of Agriculture
  - Forest Service
  - Soil Conservation Service
- Advisory Council on Historic Preservation
- Department of Transportation
  - Federal Highway Administration
- Environmental Protection Agency
- Department of Energy
- Department of the Navy

#### State Governments and Agencies

- Utah Division of Wildlife Resources
- Utah State Clearinghouse
- Colorado State Clearinghouse

#### U.S. Senators and Representatives

- Utah
- Colorado

#### State Legislators

- Utah
- Colorado

#### Indian Tribes

- Ute Indian Tribe



Appendix 1 (Continued)

Local Governments

Utah

Uintah County Commission

Grand County Commission

Colorado

Moffat County Commission

(A detailed mailing list is available upon request from Curtis Tucker, BLM, Vernal District Office.)

Copies of the draft EIS may be inspected at the following offices:

Utah State Office, University Club Building, 136 East South Temple, Salt Lake City, Utah 84111

Vernal District Office, 170 South 500 East, Vernal, Utah 84078







## APPENDIX 2

### MAJOR FEDERAL AUTHORIZING ACTIONS

- SECTION A: Major Federal Authorizing Actions  
 SECTION B: Major State Authorizing Actions  
 SECTION C: Major County and Local Authorizing Actions  
 SECTION D: Resources Requiring Formal Consultation  
 SECTION E: Federal Laws Affecting Oil Shale and Tar Sand Development

#### SECTION A

Agency	Nature of Action	Authority	Project Feature
DEPARTMENT OF THE INTERIOR Bureau of Land Management	Grant rights-of-way	Title V of Federal Land Policy and Management Act of 1976, 43 U.S.C. Sections 1761-1771; CFR Part 28; and Section 28 of the Mineral Leasing Act, 30 U.S.C. Section 185; 43 CFR Part 2880	Corridor facilities; access roads, power transmission line, water supply pipeline, ore conveyors, underground mining tunnels, communication lines
	Grant rights-of-way on BLM, F&WS and FS land	Section 28 of the Mineral Leasing Act of 1920, 30 U.S.C. Section 185; 43 CFR Part 2880	Oil pipelines
	Issue leases and permits	Section 302 of Federal Land Policy and Management Act of 1976; 43 U.S.C. Section 1732	Facilities (other project components) not related to rights-of-way
	Issue temporary use permits	Title V of Federal Land Policy and Management Act: Section 28 of the Mineral Leasing Act of 1920	Temporary construction activities



Appendix 2 (Continued)  
SECTION A  
Major Federal Authorizing Actions

Agency	Nature of Action	Authority	Project Feature
National Park Service	Issue antiquities or archaeological resource permit to excavate or remove archaeological resources on Public Lands	Antiquities Act of 1906; 16 U.S.C. Sections 431-433; Archaeological Resources Protection Act of 1979, 16 U.S.C. Sections 470aa-47011; 43 CFR Part 3	Access roads, power transmission lines, communication lines, water supply pipeline, and ore conveyor on public lands
Bureau of Indian Affairs (Uintah and Ouray Agency)	Grant rights-of-way to cross Indian lands	25 U.S.C. Sections 323-328; 25 CFR Part 161	Access roads, power transmission lines, water supply pipeline, product pipeline
U.S. Fish and Wildlife Service (Ouray National Wildlife Refuge)	Concur in right-of-way crossing National Wildlife Refuge Land	Section 28 of the Mineral Leasing Act of 1920, 30 U.S.C. Section 185; 50 CFR Section 29.21	Shale oil pipeline
	Review impact on threatened or endangered species of fish, wildlife, or plants	Section 7 of Endangered Species Act of 1973, 16 U.S.C. Section 1536; 50 CFR Part 402	All
ENVIRONMENTAL PROTECTION AGENCY	Receive and approve spill prevention control and countermeasure plan	Section 311 of Federal Water Pollution Control Act Amendment of 1972, 33 U.S.C. Section 1321; 40 CFR Part 112	Intermediate and product storage tanks
	Issue Resource Conservation and Recovery Permit for treatment, storage, or disposal of hazardous waste	Section 3005 of Resource Conservation and Recovery Act of 1976, 42 U.S.C. Section 6925; 40 CFR Parts 122, 124, 260-267	Hazardous waste disposal



Appendix 2 (Continued)  
SECTION A  
Major Federal Authorizing Actions

Agency	Nature of Action	Authority	Project Feature
	Register generators of hazardous waste	Section 3002 of Resource Conservation and Recovery Act of 1976, 42 U.S.C. Section 6922; 40 CFR Parts 122, 262	Hazardous waste generation
	Issue a nondischarging National Pollutant Discharge Elimination System Permit	Section 402 of Federal Water Pollution Control Act Amendments of 1972, as amended; 33 U.S.C. Section 1342; 40 CFR Parts 122, 123, 124, and 125	Water ponds and treatment plants
	Issue permit for reinjection of mine water	Part C of Safe Drinking Water Act, 42 U.S.C. Sections 300h to 300h-3; 40 CFR Parts 122, 124, 146	Underground injection wells. (The Utah Department of Health, Division of Environmental Health, Bureau of Water Pollution Control has applied for primacy under the UIC program. Once primacy is attained, this permit will not be required.)
	Permit manufacture of shale oil	Section 3 of Toxic Substances Control Act, 15 U.S.C. Section 2604	Shale oil retorts
DEPARTMENT OF TRANSPORTATION Federal Aviation Administration	Issue air space permit for airport-related air space determination and air space obstruction clearance for project facilities	Section 1101 of the Federal Aviation Act of 1958, 49 U.S.C. Section 1501; 14 CFR Part 77	Stacks at plant site and other facilities



Appendix 2 (Continued)  
SECTION A  
Major Federal Authorizing Actions

Agency	Nature of Action	Authority	Project Feature
Federal Highway Administration	Issue permit(s) to cross Federal-aid highways	23 U.S.C. Sections 116, 123, 315; 23 CFR Part 645 Subpart B	Water pipelines, ore conveyor, access roads, etc.
Research and Special Programs Administration Office of Operations and Enforcement	Regulate safe construction and operation of pipelines	18 U.S.C. Section 834; 49 U.S.C. Section 1655; 49 CFR Part 195	Pipelines
DEPARTMENT OF AGRICULTURE U.S. Forest Service (Uinta and Wasatch-Cache National Forests)	Concur in right-of-way grant for crossing National Forest System land	Section 28 of the Mineral Leasing Act of 1920, 30 U.S.C. Section 185; 43 CFR Part 2880; 36 CFR Part 251	Shale oil pipeline
	Issue permit for borrow materials	Materials Act, 30 U.S.C. Sections 601, 602; 30 CFR Section 251.4	Construction materials for shale oil pipeline
	Issue special use permit for constructing rights-of-way and facilities	Title V of the Federal Land Policy and Management Act of 1976, 43 U.S.C. Sections 1761-1771; Section 28 of the Mineral Leasing Act, 30 U.S.C. Section 185	Construction of shale oil pipeline (including access roads, field offices, and staging areas)
	Issue antiquities or archaeological resource permit to excavate and remove archaeological resources on National Forest System lands	Antiquities Act of 1906, 16 U.S.C. Sections 431-433; Archaeological Resources Protection Act of 1979, 16 U.S.C. Sections 470aa-47011; 43 CFR Part 3	Construction of shale oil pipeline (including access roads, field offices, and staging areas)



Appendix 2 (Continued)  
SECTION A  
Major Federal Authorizing Actions

Agency	Nature of Action	Authority	Project Feature
DEPARTMENT OF THE ARMY U.S. Army Corps of Engineers	Issue (Section 404) permit for placement of dredged or fill material in waters of the United States or their adjacent wetlands	Section 404 of the Federal Water Pollution Control Act Amendments of 1972, 33 U.S.C. Section 1344; 33 CFR Parts 323, 325	River or stream crossings for access roads, water supply pipeline, product pipelines, etc.
	Issue permit (Section 10) for structures or work in or affecting navigable waters of the U.S.	Section 10 of the River and Harbor Act of 1899, 33 U.S.C. Section 403; 33 CFR Parts 320-322, 329	Water diversion facilities, dams, wells, and construction resulting in alterations to water course
DEPARTMENT OF THE TREASURY Bureau of Alcohol, Tobacco, and Firearms	Issue permit(s) to purchase, store, and use explosives	Section 1102(a) of Organized Crime Control Act of 1970, 18 U.S.C. Sections 841-848; 27 CFR Part 181	Transport and use of explosives
DEPARTMENT OF LABOR Mine Safety and Health Administration	Approve mine safety plans and facilities	Federal Mine Safety and Health Act of 1977, 30 U.S.C. Sections 801 et. seq.; 30 CFR Chapter 1.	Mining and crushing facilities
Occupational Safety and Health Administration	Inspect surface construction for worker safety	Occupational Safety and Health Act of 1970, 29 U.S.C. Sections 651 et. seq.; 29 CFR Part 2200	Construction of processing surface facilities (Federal role limited to assisting and auditing Utah Industrial Commissions enforcement of state OSHA plan)
FEDERAL COMMUNICATIONS ADMINISTRATION	License to operate industrial radio service	Section 303 of Communications Act of 1934, 47 U.S.C. Section 303; 47 CFR Parts 90, 94	Communications



Appendix 2 (Continued)  
SECTION A  
Major Federal Authorizing Actions

Agency	Nature of Action	Authority	Project Feature
DEPARTMENT OF ENERGY Economic Regulatory Administration	Grant exemption from requirement that new major fuel-burning installation be designated to burn coal	Energy Supply and Environmental Coordination Act of 1974, 15 U.S.C. Sections 791-798; 10 CFR Parts 303-305	A "major fuel-burning installation" includes any boiler, burner, or other combustion or any combination thereof, at a single site which burns fossil fuels

E=Enercor-Mono Power, M=Magic Circle, P=Paraho; S=Syntana-Utah; and T=Tosco.

\*Unless specified, the authorizing actions apply to all of the proposed projects.

\*\*Applies only to Tosco Salt Lake City Alternative Product Pipeline.



Appendix 2 (Continued)  
SECTION B  
Major State Authorizing Actions

Agency	Nature of Action	Authority	Project Feature
UTAH DEPARTMENT OF NATURAL RESOURCES AND ENERGY			
Division of State Lands	Grant rights-of-way	Utah Code Annotated Section 65-2-1 (1978)	Corridor facilities; access roads, power transmission line, water supply pipeline, ore conveyors, shale oil pipeline, communication lines
	Issue special use permits for State Forest land	Utah Code Annotated Section 65-2-1 (1978)	Corridor facilities; access roads, power transmission line, water supply pipeline, ore conveyors
	Approve state mineral leases	Utah Code Annotated Section 65-1-18 (1978); Utah Rules and Regulations Governing the Issuance of Mineral Leases	Mines
	Well driller's permit	Utah Code Annotated Section 73-5-25 (1981)	Water wells
Division of Water Rights	Permits to construct diversion facilities or change place or nature of use of an existing water right	Utah Code Annotated Section 73-3-3 (1981)	Water diversion facilities
	Certificate to appropriate water	Utah Code Annotated Section 73-3-1 to 29 (1981)	Use of previously unappropriated water
	Approve plans and specifications for construction or repair of dams	Utah Code Annotated Section 73-3-5 (1981)	Construction of any impoundment dam



Appendix 2 (Continued)

SECTION B

Major State Authorizing Actions

Agency	Nature of Action	Authority	Project Feature
Division of Forestry and Fire Control	Approval of plan to alter natural stream	Utah Code Annotated Section 73-3-29 (1981)	Alteration of a natural stream
	Burning permit during closed fire season	Utah Code Annotated Section 24-2-12 (1976)	Burning of slash and waste
	Issue Notice of Intention to Commence Exploratory Drilling; Notice of Intention to Commence Mining	Utah Code Annotated Section 40-8-13, (Supp. 1981); Rule M-3, Board of Oil, Gas, and Mining Form MR-1	Exploratory drilling and coring; mining operation and reclamation
UTAH DEPARTMENT OF DEVELOPMENT SERVICES Division of State History	Issue permit to survey or disturb archaeological or paleontological site on state land	Utah Code Annotated Section 63-18-25 (1978)	All
	Review impact on historical or cultural sites on or eligible for National Register of Historic Places	Section 106 of National Historical Preservation Act of 1966, 16 U.S.C. Section 470f; 36 CFR Part 800	All
	Issue encroachment permits	Utah Code Annotated Section 27-12-11 (1976)	State and federal highway crossings
UTAH DEPARTMENT OF TRANSPORTATION Highway Patrol	Issue overweight truck permits for delivery of materials to plant site	Utah Code Annotated Section 27-12-155 (1976)	Delivery of materials



Appendix 2 (Continued)

SECTION B

Major State Authorizing Actions

Agency	Nature of Action	Authority	Project Feature	
UTAH DEPARTMENT OF HEALTH, DIVISION OF ENVIRONMENTAL HEALTH				
	Bureau of Air Quality	Issue open burning permit	Utah Code Annotated Section 26-13-6(1) (Supp. 1981)	Burning of slash and waste material
		Approve notice of intent to construct source of air pollution (includes prevention of significant deterioration (PSD) permit)	Utah Code Annotated Section 26-13-6 (Supp. 1981)	Construction and operation activity
Bureau of Water Pollution Control	Issue permit for construction and operation of sanitary and industrial wastewater treatment facilities	Utah Code Annotated Section 26-11-8 (Supp. 1981)	Wastewater treatment facilities	
	Issue permit for reinjection of mine water	Utah Code Annotated Section 26-11-6(14) (Supp. 1981)	Underground injection wells	
UTAH DEPARTMENT OF WATER POLLUTION Division of Environmental Health				
	Bureau of Solid and Hazardous Waste	Issue permit to treat, store, or dispose of hazardous waste	Utah Code Annotated Section 26-14-8 (Supp. 1981)	Disposal of Hazardous waste
		Approval for disposal of solid waste	Utah Code Annotated Section 26-14-6(6) (Supp. 1981)	Solid waste disposal



Appendix 2 (Continued)

SECTION B

Major State Authorizing Actions

Agency	Nature of Action	Authority	Project Feature
Bureau of Public Water Supply	Issue permit for drinking water system	Utah Code Annotated Section 26-12-5(a) (Supp. 1981)	Drinking water system
UTAH INDUSTRIAL COMMISSION Division of Occupational Safety and Health	Inspect surface construction for worker safety	Utah Code Annotated Sections 35-91 et seq. (1974)	Surface shale processing facilities downstream of pyrolysis units
DEPARTMENT OF COMMUNITY AND ECONOMIC DEVELOPMENT Division of Community Development	Receive Socioeconomic Impact Alleviation Plan	Utah Code Annotated Section 63-51-10 (Supp. 1981)	Socioeconomic and population increases



Appendix 2 (Continued)  
SECTION C  
Major County and Local Authorizing Actions

Agency	Nature of Action	Authority	Project Feature
UINTAH COUNTY	Issue building permits	Utah County Zoning Ordinance	Plant site and surface facilities
	Issue temporary use permits	Utah County Zoning Ordinance	Temporary construction of offices and sheds
	Issue conditional use permit	Utah County Zoning Ordinance	Solid waste disposal sites
	Issue extraction of earth products permit	Utah County Zoning Ordinance	Borrow areas
	Issue excavation permit	Grand County Zoning Ordinance	Excavation
A2-1 GRAND COUNTY	Issue building permit	Grand County Zoning Ordinance	Plant site and surface facilities
	Approval of master plan by the Grand County Planning Commission and County Commissioners	Grand County Zoning Ordinance	New town site
	Issue inspection and letter of approval for public health-related facilities on plant sites and at construction camps	Utah Code Annotated, 1981 Supplement; Title 26, Chapter 24, Section 1-24	Construction camps, individual wastewater disposal systems, non-public water systems, and food service facilities at the plant sites
UINTAH BASIN DISTRICT HEALTH DEPARTMENT			



Appendix 2 (Continued)  
SECTION D  
Resources Requiring Formal Consultation

Item	Basis of Requirement	Agency to be Consulted
Cultural (Historical) Resources	Antiquities Act 1906 Preservation Act 1966 Executive Order 11593	State Historic Preservation Officer (SHPO)
Floodplains	Executive Order 11988	Council of Environmental Quality, Environmental Protection Agency, Fish and Wildlife Service, and Public Notice
Endangered or Threatened Species	Section 7 of Endangered Species Act	Fish and Wildlife Service
Fish and Wildlife Coordination Act	Section 662(a) of Fish and Wildlife Coordination Act	Fish and Wildlife Service and State Game and Fish Agency
Prime or Unique Farmlands	Farmland Protection Policy Act	Soil Conservation Service State Conservationist (Document Review)
Water	Section 404 Clean Water Act	Corps of Engineers, State Engineer
	Safe Drinking Water Act	Division of Environmental Health
Water Rights	Federal Land Policy and Management Act	State Engineer
Wetlands	Executive Order 11990	Issue Public Notice
Parks, Recreation Areas, Refuges, Historic Sites	Section 4(f) Department of Transportation Act of 1966	Department of Transportation



Appendix 2 (Continued)  
SECTION E  
Federal Laws Affecting Oil Shale and Tar Sand Development

Popular Name	Public Law/U.S. Code Citation	Purpose/Requirements	Major Relevance
Antiquities Act of 1906	59-209; 16 U.S.C. 431-433	Regulates antiquities excavation and collection on lands under Secretary of Interior's jurisdiction  Protects historic monuments and ruins on Public lands	Mitigates potential harm to historical and archaeological resources
Archaeological and Historical Preservation Act of 1974; Archaeological Salvage Act	93-291, 86-523; 16 U.S.C. 469	Provides for recovery of data from areas to be affected by federal actions, including federally licensed projects	Mitigates potential harm to historical, archaeological, and paleontological resources
Archaeological Resources Protection Act of 1979	96-95	Provides for preservation of data (including relics and specimens) at every federal construction project and federally licensed project  Protects archaeological resources by regulating excavation and collection on Public and Indian lands	Mitigates potential harm to historical and archaeological resources  Mitigates potential harm to historical and archaeological resources
Bald Eagle Protection Act of 1969, as amended	86-70; 16 U.S.C. 668	Protects bald and golden eagles	May require certain limitations on developments



Appendix 2 (Continued)  
SECTION E  
Federal Laws Affecting Oil Shale and Tar Sand Development

Popular Name	Public Law/U.S. Code Citation	Purpose/Requirements	Major Relevance
Clean Air Act Amendments of 1977	95-95; 42 U.S.C. 7401	Establishes requirements for areas failing to attain National Ambient Air Quality Standards (NAAQS)	Limits industrial development within and adjacent to areas exceeding NAAQS (nonattainment areas) and protects air quality in areas where the quality is better than NAAQS (attainment areas).
		Provides for prevention of significant deterioration of areas where air is cleaner than NAAQS	
		Modifies 1970 Clean Air Act provisions regarding federal facilities, enforcement strategies, and interstate air pollution	
Clean Water Act of 1977	95-217; 33 U.S.C. 1251	Establishes effluent limitation for new and existing industrial discharge into U.S. waters	May reduce development options if antidegradation policy restricts discharges into high quality waters
		Provides mechanism to restore and maintain integrity of the Nation's waters	Treatment facilities in areas with rapidly expanding infrastructures must meet water quality standards
Endangered Species Act of 1973, as amended	93-205; 16 U.S.C. 1531	Protects endangered and threatened species and critical habitat from federal activities	Requires prior consultation with Fish and Wildlife Service



Appendix 2 (Continued)  
SECTION E  
Federal Laws Affecting Oil Shale and Tar Sand Development

Popular Name	Public Law/U.S. Code Citation	Purpose/Requirements	Major Relevance
Fish and Wildlife Coordination Act of 1934, as amended	85-624; 16 U.S.C. 661	Requires consultation about water resource development actions which might affect fish or associated wildlife resource	Mitigates potential federal oil shale development impacts
Historic Preservation Act of 1966	89-665; 16 U.S.C. 470	Establishes system to classify properties on or eligible for inclusion on Historic Register  Mandates federal agency consultation with Advisory Council and State Historic Preservation Officers	Mitigates potential harm to historical and archaeological values
Migratory Bird Treaty Act of 1941, as amended	16 U.S.C. 701-718h	Protects migrating birds not covered by other federal laws	Provides legislation to purchase areas for refuges and to provide for migratory bird conservation
National Environmental Policy Act of 1969 (NEPA)	91-190; 42 U.S.C. 4321	Encourages productivity and harmony between man and his environment; ensures that environmental values are considered in decisionmaking; makes environment protection a duty of every federal agency  Requires impact statements for major federal actions with potentially significant impacts	Provides legislative mandate to consider environmental review of major federal action in energy development  Impact statement process must be integral part of oil shale leasing system



Appendix 2 (Continued)  
SECTION E  
Federal Laws Affecting Oil Shale and Tar Sand Development

Popular Name	Public Law/U.S. Code Citation	Purpose/Requirements	Major Relevance
Resource Conservation and Recovery Act of 1976	94-580; 42 U.S.C. 6901, as amended	Establishes guidelines for collection, transport, separation, recovery and disposal of solid	Mining locations may be affected by EPA regulations governing disposal of oil shale mining wastes
		Creates major federal hazardous waste regulatory program	Industry may have stringent permit requirements if wastes classified by EPA are hazardous
		Provides assistance to establish state or regional solid waste plans	
Safe Drinking Water Act of 1977	95-190; 42 U.S.C. 300f-j	Protects water quality; sets national standards	Requires states (or EPA) to regulate harmful injections which endanger public drinking water system



## APPENDIX 3

# ALLOTMENT MANAGEMENT CATEGORY CRITERIA

### Maintain Category Criteria

Present range condition is satisfactory.

Allotments have moderate or high resource production potential, and are producing near their potential (or trend is moving in that direction).

No serious resource-use conflicts exist.

Opportunities may exist for positive economic return from public investments.

Present management appears satisfactory.

Other criteria appropriate to the environmental impact statement (EIS) area.

### Improve Category Criteria

Present range condition is unsatisfactory.

Allotments have moderate to high resource production potential and are producing at low to moderate levels.

Serious resource-use conflicts exist.

Opportunities exist for positive economic return from public investments.

Present management appears unsatisfactory.

Other criteria appropriate to EIS area.

### Custodial Category Criteria

Present range condition is not a factor.

Allotments have low resource production potential, and are producing near their potential.

Limited resource-use conflicts may exist.

Opportunities for positive economic return on public investment do not exist or are constrained by technological or economic factors.

Present management appears satisfactory or is the only logical practice under existing resource conditions.

Other criteria appropriate to EIS area.







## **APPENDIX 4**

### **SPECIALIZED MINERAL TERMINOLOGY**

The impact analysis presented in this EIS assumed compliance with mitigation measures that likely would be rewritten as stipulations attached to federal or state authorizations. This agency-committed mitigation falls into two categories--provisions of the existing oil and gas leases that could be carried forward, in some form, as part of a new combined hydrocarbon lease; and general measures typically included in agency authorizations for projects similar to the ones studied in this EIS.

#### **EXISTING OIL AND GAS PROVISIONS**

Under the conversion regulations (47 CFR 3140.4-2), a combined hydrocarbon lease will contain all appropriate terms and conditions required to ensure compliance with the plan of operations, including any necessary stipulations that were part of the original oil and gas lease being converted. General provisions of an oil and gas lease that could be carried forward if a lease is converted are identified below. However, the actual stipulations that would be included for a specific combined hydrocarbon lease would be determined on a case-by-case basis.

1. The lessee shall submit in writing to the Bureau of Land Management (BLM) District Manager for advance written approval, a detailed plan of operations, which will discuss any operation that could result in property damage, land disturbance, or induce erosion, including any planned use of earth-moving or similar mobile equipment. Operations that will be discussed in the plan include, but are not limited to, exploratory drilling, construction of access roads, and seismographic explorations.
2. Any drilling, construction, or other operation on the leased lands that will disturb the land surface or otherwise affect the environment shall be subject to prior approval by the BLM.
3. Activities on the lease shall be done in accordance with applicable regulations, including such requirements as the BLM may prescribe as necessary to prevent environmental damage.

#### **REQUIRED GENERAL MEASURES DESIGNED TO REDUCE IMPACTS**

As a condition of granting any lease conversions and/or other authorizations the various agencies would require that certain terms and conditions are met. Some of these general measures are presented in this appendix. As project plans are finalized and before specific authorizations are given, additional specific requirements would be added by the various authorizing agencies, including a wildlife mitigation plan developed jointly by the BLM, Utah Division of Wildlife Resources (UDWR), Forest Service (FS), and the applicants.

The federal government has mandates to protect: threatened and endangered species and their critical habitat; historical, archaeological, and paleontological resources; and wild horses. Also, there are mandates to protect areas currently being managed to protect their potential classification as wilderness areas. Other areas having special designation



#### Appendix 4 (Continued)

must also be protected. It is also assumed that sufficient funding and manpower would be available to properly enforce the required mitigating measures.

Authority for mitigation of loss of vegetation, livestock forage, wildlife habitat, archaeological and paleontological values, and a reduction in water and air quality, aesthetics, and recreation on federal lands, is granted under the following acts:

- Organic Administration Act of 1897
- Reclamation Act of 1902
- Preservation of American Antiquities Act of 1906
- Wilderness Act of 1964
- Historic Preservation Act of 1966
- Executive Order 11593 of 1971 (Protection and Enhancement of the Cultural Environment)
- Archaeological and Historical Data Preservation Act of 1974
- Federal Land Policy and Management Act of 1976
- The Clear Air Act, as amended, 1977
- The Federal Clean Water Act of 1977
- Endangered Species Act, as amended, 1978
- Executive Order 12088

Federal regulatory agencies would also require compliance with safety and noise level regulations imposed by the Occupational Safety and Health Act of 1970; with the Federal Aviation Administration clearance standards, granted under authority of the Federal Aviation Act of 1958; and with grounding and clearance requirements of the National Electric Safety Code.

As future conditions may result in project plan refinement or adjustment, all mitigating measures outlined here could be modified, as necessary, within authorized limits by the appropriate federal official.

Should future off-lease rights-of-way be necessary on federal lands, further environmental analyses would be conducted with future right-of-way grants, a Construction, Operation, and Maintenance (COM) plan, or similar document would be prepared covering the construction of all project facilities on federal land. This plan would be submitted for approval to the authorizing agency before work on the ground begins. The COM plan would contain the following sections on site-specific stipulations: (Because the various actions would be composed of many types of terrain, soils, vegetation, land uses, and climatic conditions, the sections within the COM plan would include sets of techniques and measures tailored to each condition encountered).

- Fire Protection
- Clearing
- Visual Resources
- Erosion Control, Revegetation, and Restoration--specific guidelines for the Erosion Control, Revegetation, and Restoration Section of the COM plan are included in this EIS as Appendix 3, Reclamation and Erosion Control Programs



#### Appendix 4 (Continued)

- Transportation
- Communications
- Cultural Resources
- Threatened and Endangered Studies and Mitigation (including a wildlife mitigation plan developed jointly by UDWR, BLM, FS, and the applicants)
- Blasting
- Pesticide and Herbicide Use
- Health and Safety
  - a. Solid Waste
  - b. Emergency Response
  - c. Air Quality
  - d. Transportation
- Site Prescription
- Right-of-Way Maintenance and Monitoring

Technical assistance and approval of written plans for federal lands would be obtained from the BLM, prior to any construction. Under authority of Section 504 of the Federal Land Policy and Management Act (FLPMA), the applicants would be required to provide funding to the appropriate federal agencies for the purpose of financing one or more specialists for administration of construction activities.

#### BUREAU OF LAND MANAGEMENT

1. All state and federal regulations and laws will be complied with.
2. All activities associated with the projects will be conducted in a manner that will avoid or minimize degradation of air, land, and water quality. In the construction, operation, maintenance, and abandonment of energy projects, activities will be performed in accordance with applicable air and water quality standards, and related plans of implementation, including but not limited to, the Clean Air Act, as amended (42 USC 1321), and the Clean Water Act (USCA 1251).
3. Permittees and other regular users of public lands affected by construction of the projects will be notified in advance of any construction activity that may affect their businesses or operations. This will include, but not be limited to, signing of temporary road closures, notification of proposed removal and/or cutting of fences, and disturbances to range improvements or other use-related structures.

#### Transportation

1. A transportation plan will be submitted as part of the COM plan. This plan will cover approval of temporary, reconstructed, and newly constructed roads and will include clearing work, signing, rehabilitation, and uses associated with transportation needs. Overland access could be specified in lieu of road construction or reconstruction.
2. Access roads necessary for operation and maintenance of the projects will be clearly identified. Some of these access roads may be designated by the authorizing agency as open for public use, including but not limited to, off-road vehicle (ORV) travel.



#### Appendix 4 (Continued)

3. Helicopters will be used to string pipe and deliver equipment in areas where access due to the terrain or management constraints preclude standard construction.
4. Portions of the lease conversion and other authorized areas for use will be used as access roads only when necessary and only during the construction period. The temporary access roads will be closed and vegetative cover reestablished after construction is completed. No maintenance roads along linear facilities will be permitted.
5. The applicants will control ORV use within the lease conversion areas. Such specified control could include use of physical barriers, replanting trees, or other reasonable means of ORV control.
6. Gates or cattle guards on established roads on public land will not be locked or closed by the applicants.

#### Land Use

1. Disturbance of improvements such as fences, roads, and watering facilities during construction, operation, and maintenance must be kept to an absolute minimum. Immediate restoration of any damage of improvements to at least their former state will be required. Functional use of these improvements must be maintained at all times. When necessary to pass through a fence line, the fence shall be braced on both sides of the passageway prior to cutting of the fence. A gate acceptable to the authorizing agency official shall be installed in the gate opening and kept closed when not in actual use. Where a permanent road is to be constructed or maintained, cattleguards will be placed at all fence crossings.
2. If a natural barrier used for livestock control is broken during construction, the applicants will adequately fence the area to prevent drift of livestock. Fence specifications will be determined on a case-by-case basis.

#### Water

1. All river, stream, and wash crossings required for access to project facilities will be at existing roads or bridges, except at locations designated by the authorized officer. Culverts or bridges will be installed at points where new permanent access roads cross live streams to allow fish to pass unobstructed. Where temporary roads cross drainages or dirt fills, culverts will be installed and removed upon completion of the project. Any construction activity in a perennial stream is prohibited unless specifically allowed by the authorized officer. All stream channels and washes will be returned to their natural state.
2. Construction plans for crossing streams by boring, driving, or trenching will be approved by the authorized officer.



#### Appendix 4 (Continued)

3. A buffer strip of terrestrial vegetation above the high water line will be left between work areas adjacent to the stream and the stream itself.
4. In streams, construction will be planned to coincide with low water flows.
5. The applicants will complete the work and return the stream to its natural state as soon as possible.
6. Stream banks will be returned, as nearly as possible, to their original condition.
7. Backfill material for any pipes in the streambed will be of predominantly coarse material.

#### Waste

1. Construction equipment must be refueled and maintained outside of stream channels in areas designated by the authorized officer.
2. Garbage and other refuse will be disposed in an authorized disposal site or landfill. Engine oil changed on federal lands will be contained in suitable containers and disposed as refuse; no fuel, oil, or other hydrocarbon spills are permitted. If such a spill accidentally occurs, the authorized officer will be notified immediately and corrective measures undertaken as directed.
3. Within 30 days after conclusion of construction and operation, all construction materials and related litter and debris will be disposed in accordance with instructions from the authorized officer.

#### Vegetation

1. Vegetation cleared during construction, operation, maintenance, or other activity will be disposed of as directed.
2. Commercial tree species that are cut will be measured and paid for.
3. Disturbed areas, which in the opinion of the authorizing agency are unsuitable for successful revegetation, will be protected under the reclamation, erosion control, and revegetation provisions of the COM plan. This plan will state the method of protection to be used and the provisions for prevention of site deterioration and introduction of noxious weeds. At a minimum, the COM plan will include the reclamation, erosion control, and revegetation items described in Appendix 3 for all Federal land.
4. Preclearing of mountain brush and tree-covered areas prior to dozer and maintenance blade work will be required.



## Appendix 4 (Continued)

### Soils

1. Existing soils and geological data will be gathered and used to achieve maximum revegetation and soil erosion mitigation responses.
2. Areas subject to mudflows, landslides, mudslides, avalanches, rock falls, and other types of mass movement will be avoided where practical in locating linear facilities. Where such avoidance is not practical, the design, based upon detailed field investigations and analysis, will provide measures to prevent the occurrence of mass movements.
3. All topsoil and suitable plant growth material on federal lands will be conserved for reclamation requirements; excess topsoil will be stockpiled at designated locations.
4. All disturbed areas will be landscaped and revegetated as nearly as possible to original conditions or to a condition agreed upon by both the applicant and the authorized officer. This reclamation shall be accomplished as soon as possible after the disturbance occurs.
5. The reestablishment of vegetative cover and establishment of watershed stabilization measures will be completed during the ongoing working season and prior to the next winter season.
6. Trees and brush (indigenous species) will be established according to the revegetation, erosion control, and rehabilitation plan contained within the COM plan.
7. In areas where soil surface has been modified or natural vegetation has been removed, noxious weeds will be controlled.
8. Clearing for linear facilities in timber areas to reduce fire hazard will be limited to the lease conversion or other authorized area. Stumps will not be higher than 6 inches. The trees will be limbed and stacked adjacent to the edge of the clearing. Slash will be spread over the area or as designated by the authorized officer.
9. Fire control provisions will be included in the COM plan. The applicant will do everything reasonably possible, both independently and upon request of the authorized officer, to prevent and suppress fires on or in the immediate vicinity of the lease conversion area. This includes making available such construction, operation, and maintenance force as may be reasonably obtained for the suppression of fires.

### Visual Resources

1. A plan to minimize visual impacts will be required as a part of the COM plan. The applicants will design and locate the lease conversion elements to blend into the existing environment so that they most nearly meet the minimum degree of contrast acceptable for the Visual Resource Management class in which the structures would be located. The



#### Appendix 4 (Continued)

authorizing agency will evaluate and approve measures before construction begins.

2. Edges of vegetative clearings will be feathered, where feasible, to avoid straight lines.

#### Cultural Resources

All significant cultural resources identified on the project area will be avoided wherever possible. For significant cultural resources that cannot be

avoided, a Memorandum of Agreement with the Advisory Council on Historic Preservation and the Utah State Historic Preservation Office will be developed that details specific mitigation measures in accordance with 36 CFR 800. All cultural resources discovered during construction that were not previously identified will be left undisturbed until they can be evaluated for significance.

#### Paleontology

The applicant will provide a qualified paleontologist who is approved by the authorized officer. The paleontologist will conduct an intensive survey of all areas to be disturbed according to the significance and mitigation needs specified by the applicants. The paleontologist will be available, as needed, during surface disturbance. If in the opinion of the paleontologist, paleontological values specified by the applicants would be disturbed, construction will be halted until appropriate action could be taken.

#### Wildlife

1. Development of the proposed lease conversions may have an effect on threatened or endangered species. However, the current project descriptions do not contain sufficient information to make a full determination as to whether or not the eventual developments would jeopardize the continued existence of any of the threatened or endangered species found in the region. This is particularly true for eventual water use from the Colorado River system in relation to endangered fish species. Therefore, it would be necessary for BLM to request Section 7 (Endangered Species Act) consultation with the Fish and Wildlife Service (FWS) on a project-by-project basis as each plan of operations is reviewed for approval. Each converted lease would contain the following special provision in order to avoid a Section 7 jeopardy biological opinion:

"The lessee shall develop a detailed plan of operations which will fully protect listed or proposed threatened or endangered species and shall submit the plan to BLM for formal consultation with the FWS as required by Section 7 of the Endangered Species Act. The plan must contain provisions that protect species occurring on site as well as those off-site species that may be adversely affected. Consultation must be completed prior to the irreversible or irretrievable commitment of resource or funds for on-the-ground development.



#### Appendix 4 (Continued)

This lease is issued and accepted with the express agreement that such consultation may require adjustments to the plan of operations, additions of special conservation measures, or limitations to the project in order to assure compliance with such provisions of the Endangered Species Act as may be applicable as determined by FWS at the time of development."

2. Any active golden eagle nest found within 1 mile of project activities will have to be protected from harassment during the critical nesting period in accordance with provisions established by the Bald Eagle Protection Act.

#### Pesticides

Applicable federal and state laws and regulations concerning the use of pesticides (i.e., insecticides, herbicides, fungicides, rodenticides, and other similar substances) will be complied with in all activities and operations. The applicants will obtain program approval from the authorizing agency prior to the use of such substances. The program request will provide the type and quantity of material to be used; the pest, insect, fungus, etc., to be controlled; the method of application; the location of storage and disposals of containers; and other information that may be required. The request will be submitted no later than December 1 of the calendar year prior to the start of the fiscal year that the activities are proposed (i.e., December 1, 1984, deadline for a fiscal year 1985 action). Emergency use of pesticides will be approved by the authorizing agency. A pesticide will not be used if the Secretary of the Interior or Agriculture has prohibited its use. A pesticide will only be used in accordance with its registered uses and with other Secretarial limitations. Pesticides will not be permanently stored on federal lands.

#### Fish and Wildlife Service

For protection of the habitat of the Colorado squawfish, humpback chub, bonytail chub, and razorback sucker, the applicant will be required to implement the following measures at the White and Green River pipeline crossings:

1. Install automatic shut-off valves on the pipeline.
2. Locate emergency oil spill clean-up equipment (booms and skimmers) adjacent to the river pipeline crossings.
3. Instream construction will be planned to coincide with low water flow with no construction permitted between August 1 and November 15.
4. No construction disturbance will be allowed in backwater areas.
5. Backfilling practices and reseeding with native grasses and native forbs will be required of all disturbed land on the Ouray National Wildlife Refuge.



## Appendix 4 (Continued)

### Tribe Uintah and Ouray Tribal Requirements

The Ute Indian Tribe is a local sovereign government with specific land use requirements. Final mitigation measures and stipulations would require approval of the Uintah and Ouray Agency, Bureau of Indian Affairs (BIA). Decisions of action would be made through the Ute Tribal Business Committee on a case-by-case basis.

The Ute Indian Tribe intends that these measures listed for lands and/or resources administered by federal agencies be applicable to authorizations they may issue for tribal land use.

The following are some of the provisions (general measures) that would be included in a Surface Use and Operating Plan for rights-of-way construction, operation, and maintenance on reservation lands.

1. Fire Arms. A procedure will be implemented to prevent company employees, including subcontractors, from carrying firearms or other weapons that may be used to kill game animals on reservation land.
2. Off-Road Traffic. A procedure will be implemented to confine company employees, including subcontractors, to established roads and authorized sites. The purpose for this would be to prevent soil erosion and the harassment of game or livestock due to off-road traffic such as snowmobiles, motorcycles, four-wheel drive vehicles, etc.
3. Firewood. A procedure will be implemented to prevent employees, including subcontractors and other unauthorized people, from gathering firewood. It is the policy of the Ute Indian Tribe and the BIA to require wood permits from the Forestry Section of BIA for both Indians and non-Indians harvesting wood from the Uintah and Ouray Indian Reservation.
4. Restoration. A procedure would be carried out to restore abandoned roads, or other disturbed areas to or near original conditions after completion of construction. This procedure will include: (a) stockpiling topsoil; (b) establishing original ground contour; (c) reestablishing irrigation systems where applicable; (d) redistributing topsoil to the ground surface on disturbed areas; (e) on irrigated fields reestablishing soil conditions in such a way as to ensure cultivation and harvesting of crops; (f) a procedure to ensure revegetation of the disturbed areas to the specifications of the Ute Indian Tribe or the BIA at the time of completion of construction.
5. Signs. All roads constructed by the applicants on the Uintah and Ouray Indian Reservation will have appropriate signs. Signs will be neat and of sound construction and state: (a) the land is owned by the Ute Indian Tribe; (b) the name of the applicant; (c) prohibition of firearms to all non-Ute Tribal members; (d) permits are required from the BIA; and (e) only authorized personnel permitted.



#### Appendix 4 (Continued)

6. Rights-of-Way. The BIA and the Ute Indian Tribe will make rights-of-way available without cost to oil shale companies when both mineral rights and surface rights are owned by the Ute Indian Tribe when the right-of-way is for direct Tribal development. It is the policy that the right-of-way be approved and a charge assessed for damages prior to the time an oil shale company begins any construction activities. When the surface is owned by another entity and the mineral rights are owned by the Ute Indian Tribe, rights-of-way must be cleared with the other entity.
7. Permit for Water or Earth Fill. If water or fill materials are needed to construct roads or for other authorized uses, proper permits would be needed. Included in the plan will be: (a) the approximate amount of water or material needed; (b) who owns the rights to the water or materials which are planned to be used; (c) the location where water and materials would be obtained; and (d) the approximate time period in which water or materials would be used.
8. Weeds. A plan will be developed and carried out for controlling noxious weeds along rights-of-way for roads, pipelines, or other applicable facilities. (A list of noxious weeds can be obtained from the appropriate county.)
9. Litter. A plan will be developed and carried out to keep the applicable sites free from litter and groomed in a neat and professional condition.
10. Bench Marks. A bench mark will be established near each authorized use in a location where it would not be destroyed. The bench mark would be set in concrete with a brass cap. The brass cap would show the use number and elevation to the nearest one-tenth of a foot. The engineering drawing showing the cuts/fills for the use would be required to show elevations in relation to the bench marks.

#### Corps of Engineers

The Corps of Engineers (COE) has prescribed management practices that will be followed to the maximum extent practical, for discharges covered by the Nationwide Permit (items 1 through 8 below). Additionally, certain conditions (33 CFR 330) must be met under the Nationwide Permit authority (items 9 through 17 below). For further detail, please refer to the COE Permit Program "A Guide For Applicants," November 1, 1977.

1. Discharges of dredged or fill material into United States water will be avoided or minimized through the use of other practical alternatives.
2. Discharges in spawning areas during spawning seasons will be avoided.
3. Discharges will not be allowed to restrict or impede the movement of aquatic species indigenous to the waters, impede the passage of normal or expected high flows, or cause the relocation of the waters (unless the primary purpose of the fill is to impound waters).



#### Appendix 4 (Continued)

4. If the discharge creates an impoundment water, adverse impacts on the aquatic system caused by the accelerated passage of water and/or the restriction of its flow will have to be minimized.
5. Discharges in wetland areas will be avoided.
6. Heavy equipment working in wetlands will be placed on mats.
7. Discharges into breeding and nesting areas for migratory waterfowl will be avoided.
8. All temporary fills will be removed in their entirety.
9. There cannot be any change in preconstruction bottom contours. (Excess material will be removed to an upland disposal area.)
10. The discharge cannot occur in the proximity of a public water supply intake.
11. The discharge cannot occur in areas of concentrated shellfish production.
12. The discharge cannot destroy a threatened or endangered species as identified under the Endangered Species Act or endanger the critical habitat of such species.
13. The discharge cannot disrupt the movement of those species of aquatic life indigenous to the waterbody.
14. The discharge will consist of suitable material free from toxic pollutants in other than trace quantities.
15. The fill created by a discharge will be properly maintained to prevent erosion and other nonpoint sources of pollution.
16. The discharge will not occur in a component of the National Wild and Scenic River System or in a component of a State Wild and Scenic River System.
17. No access roads, fills, dikes, or other structures will be constructed below the ordinary high water level of the streams under the Nationwide Permit. These structures would require separate Section 404 permits.

#### Environmental Protection Agency

A spent shale monitoring/mitigation plan needs to contain several basic elements including; surface runoff control including either a pile underdrain or over-the-top drainage with erosion control, retention dams (for surface runoff), in place soil moisture monitoring either by cup lysimeters, moisture cells and/or dry wells for continuous neutron logging and deep ground water monitoring wells of all nearby aquifers including various depth monitoring by either packers or nested wells.



#### Appendix 4 (Continued)

Another potential problem with spent and new shale concerns auto-oxidation. Oxidation of raw and spent shale would raise pile temperatures and could threaten a fire. The likelihood for auto-oxidation depends upon several factors; the amount and type of carbon in the shale, the size of the spent shale, the temperature at which the spent shale is laid down and the air flow through the pile. EPA would recommend the following procedures to avoid excessive auto-oxidation:

1. Spent shale will be allowed to reach ambient temperature before it is laid down and compacted.
2. Raw (especially fines) and spent shale will not be mixed.
3. The entire spent shale pile will be compacted to the maximum extent (with optimum moisture) to eliminate air.
4. No carbonaceous material such as trees or shrubs (or material containing sulfur) will be mixed with the spent shale.
5. An impermeable cap will be placed over the spent shale pile to prevent moisture and air from entering.
6. Temperature monitors (thermocouples) will be installed in the shale pile.

The EPA hazardous waste regulations are found at 40 CFR 260-265 and recommends that these regulations be consulted by the companies for minimum monitoring requirements. 40 CFR part 265.91 describes the requirements for a ground water monitoring system: As recommended by EPA, a ground water monitoring system would be capable of yielding ground water samples for analysis and consist of:

1. Monitoring wells (at least one) will be installed hydraulically upgradient (i.e., in the direction of increasing static head) from the limit of the waste management area. Their number, locations, and depths would be sufficient to yield ground water samples that are:
  - representative of background ground water quality in the uppermost aquifer near the facility; and
  - not affected by the facility.
2. Monitoring wells (at least three) will be installed hydraulically downgradient (i.e., in the direction of decreasing static head) at the limit of the waste management area. Their number, locations, and depths would be to ensure that they immediately detect any statistically significant amounts of hazardous waste constituents that migrate from the waste management area to the uppermost aquifer.

In order to review this plan at a minimum the following site-specific information needs to be submitted:



#### Appendix 4 (Continued)

1. Identification of the uppermost aquifer;
2. Determination of the hydraulic properties of formations (horizontal and vertical hydraulic conductivities);
3. Data on seasonal fluctuations in the ground water surface elevation;
4. Identification of hydraulic gradients;
5. Determination of horizontal velocity of ground water; and
6. Detailed information on well installation.

#### State of Utah

1. Each applicant is required by Utah Code Annotated Section 63-51-10 (Supp. 1981) to submit a financial impact statement and plan to alleviate socioeconomic impacts. Approval of each applicant's plan will be required before issuance of any state permits required to start construction.
2. The Utah Division of Oil, Gas, and Mining (UDOGM), within the Department of Natural Resources and Energy, has responsibility for issuance of permits or approval letters for intention to commence mining operations for noncoal minerals excluding sand and gravel operations, under the authority of the Utah Mined Land Reclamation Act, 1975. The purpose of this permit is to ensure protection of the environment prior, during, and following mining activities.

#### Operation requirements:

- mine development and reclamation must proceed in accordance with the approved plan
- an annual report (Form MR-3) must be filed every year.

3. The Utah Division of State Lands and Foresty (UDSLF), within the Department of Natural Resources and Energy, has responsibility for issuance of Right-of-Way/Right-of-Entry permits, under the authority of Utah Code Annotated, 1953, Title 65. The purpose of this permit is to protect the environment and prevent illegal entry to state lands.

#### Operations Requirements:

- Following approval, permittee must fully comply with all stipulations.
  - Federal specifications shall apply to the state lands where federal lands are also involved and a Federal permit for a right-of-way has been granted.
4. The Utah Division of Environmental Health (UDEH), Bureau of Air Quality, within the Department of Health, has responsibility for approval of air pollution sources, under the authority of the Utah Air Conservation Act.



#### Appendix 4 (Continued)

The purpose of this permit is to prevent air pollution by any air pollution source except comfort heating.

##### Operations Requirements:

-No operating permit is required.

-Periodic inspection must be completed to ensure compliance with permit requirements.

-Periodic source testing at the sources expense.

5. The UDEH, Bureau of Hazardous Wastes and Radiation, within the Department of Health, has responsibility for approval of plans for hazardous waste management, treatment, storage and/or disposal facilities, under the

authority of the Utah Solid and Hazardous Waste Act. The purpose of the permit is to prevent faulty construction of these facilities which may constitute hazardous conditions.

##### Operations Requirements:

-Following approval, the owner or operator of a facility complies with the conditions of the plan approval and the requirements of the Utah Hazardous Waste Management Regulations.



# APPENDIX 5

## FORAGE ACTIONS BY ALTERNATIVES

### LEGEND

- L = Livestock Use Level  
 LA = Livestock Average Use  
 LP = Livestock Active Preference  
 WH = Wild Horse Use Level
- (a) The use level AUMs column includes decreases/increases from minerals and from active preference to average use (see Appendix 15).  
 (b) Wild horse use is summarized with Hill Creek herd in Hill Creek locality.  
 (c) Allotment is managed by Colorado through cooperative agreement.  
 (d) Since licensed use has been complete nonuse, allowable use would be 50% of active preference.

Allotment Name Allotment Num.	Current Management		Resource Protection		Commodity Production		Balanced Use	
	Use(a) Level AUMs	Management Actions	Use(a) Level AUMs	Management Actions	Use(a) Level AUMs	Management Actions	Use(a) Level AUMs	Management Actions
BLUE MOUNTAIN LOCALITY	LA 449	Continue AMP and grazing system. Note: 157 AUMs would continue on a temporary non-renewable (TNR) basis.	L 325	Reduce TNR* by 124 AUMs as follows: AUMs. reduce spring grazing by 49 AUMs to improve ecological condition and reduce competition with wildlife by 75 AUMs. Adjust AMP and grazing system to reflect change in spring use. Develop 2 reservoirs.	L 432	Reduce TNR by 17 Revise AMP and grazing system. Control burn or use chemical treatment on 1,100 acres. Develop 2 reservoirs.	L 325	Reduce TNR by 124 AUMs. Continue AMP and grazing system. Burn or use chemical treatment on 550 acres. Develop 2 reservoirs.
Blue Mountain AMP 5825	LP 292							
Cub Creek 5823	LA 54 LP 55	Season long use.	L 44	Reduce competition with L wildlife by 9 AUMs.	L 64	Season long use.	L 54	Season long use.
Doc's Valley 5821	LA 1,219 LP 1,219	Season long use.	L 812	Reduce spring grazing by 203 AUMs to improve ecological condition. Reduce competition with wildlife by 204 AUMs.	L 1,661	Develop grazing system and AMP. Control burn or treat chemically 5,400 acres.	L 1,219	Develop grazing system and AMP. Burn or treat chemically 2,700 acres.

\*Temporary nonrenewable



Allotment Name Allotment Num.	Current Management		Resource Protection		Commodity Production		Balanced Use	
	Use(a) Level	Management Actions	Use(a) Level	Management Actions	Use(a) Level	Management Actions	Use(a) Level	Management Actions
Green River 5820	LA 1,304	Season long use.	L 288	Decrease spring grazing by 537 AUMs to improve ecological condition. Decrease competition with wildlife by 218 AUMs. Restrict livestock use on floodplains and riparian habitat by 150 AUMs. Develop 1 spring.	L 1,455	Season long use. Develop 1 spring.	L 1,304	Season long use. Develop 1 spring.
	LP 1,408							
Point of Pines 5822	LA 1,454	Season long use.	L 1,169	Reduce spring grazing by 143 AUMs to improve ecological condition. Reduce competition with wildlife by 138 AUMs. Develop 1 reservoir, build 1 mile of pipeline.	L 1,458	Develop grazing system and AMP. Control burn or chemically treat 2,925 acres. Develop 1 reservoir, develop 1 mile of pipeline.	L 1,454	Develop grazing system and AMP. Burn or chemically treat 2,250 acres. Develop 1 reservoir. Build 1 mile pipeline.
	LP 1,458							
Stuntz Valley 5824	LA 1,355	Season long use.	L 1,087	Reduce spring grazing by 136 AUMs to improve ecological condition. Reduce competition with wildlife by 132 AUMs. Develop 1 reservoir.	L 1,355	Develop grazing system and AMP. Control burn or treat chemically 2,200 acres.	L 1,355	Develop grazing system and AMP. Burn or chemically treat 1,660 acres. Develop 2 reservoirs.
	LP 1,355							



Allotment Name Allotment Num.	Current Management		Resource Protection		Commodity Production		Balanced Use	
	Use(a) Level AUMs	Management Actions	Use(a) Level AUMs	Management Actions	Use(a) Level AUMs	Management Actions	Use(a) Level AUMs	Management Actions
LOCALITY SUMMARY	LA 5,835	One grazing system and AMP. Five allotments with season long use.	L 3,725	Adjust grazing to average use by decreasing 109 AUMs. Reduce spring grazing by 1,068 AUMs on 5 allotments to improve ecological condition. Reduce competition with wildlife by 776 AUMs. Restrict livestock use on floodplains and riparian habitat by 150 AUMs. Develop 4 reservoirs. Develop 1 spring. Build 1 mile of pipeline. Adjust 1 AMP and grazing system to reflect change in spring use.	L 6,425	Revise 1 AMP and grazing system. Develop 3 AMPs and 3 grazing systems. Two allotments with season long use. Control burn or treat chemically 11,625 acres. Develop 3 reservoirs. Develop 1 spring. Build 1 mile pipeline.	L 5,711	Continue 1 AMP and grazing system. Develop 3 new AMPs and grazing systems. Two allotments with season long use. Control burn or treat chemically 7,160 acres. Develop 5 reservoirs. Develop 1 spring. Build 1 mile pipeline.
LP 5,787								

BONANZA-RAINBOW  
LOCALITY

Antelope Draw 5854	LA 3,194	Season long use. by 581 AUMs to improve ecological condition.	L 2,586	Reduce spring grazing. Develop AMP and grazing system. Develop 4 reservoirs.	L 5,800	Develop 4 reservoirs. Develop AMP and grazing system.	L 3,194	Develop 4 reservoirs.
	LP 5,800							
	WH 420	Present management.	WH 540	Maximize wild horse use.	WH 0	Eliminate wild horse use.	WH 0	Eliminate wild horse use.



Allotment Name Allotment Num.	Current Management		Resource Protection		Commodity Production		Balanced Use	
	Use(a) Level AUMs	Management Actions	Use(a) Level AUMs	Management Actions	Use(a) Level AUMs	Management Actions	Use(a) Level AUMs	Management Actions
Asphalt Draw AMP 5817	LA 2,662	Continue AMP and grazing system.	L 2,051	Develop 5 reservoirs. Adjust AMP and grazing system to reflect change in spring use. Reduce spring grazing by 532 AUMs to improve ecological condition.	L 4,483	Develop 15 reservoirs. Continue AMP and grazing system.	L 2,662	Develop 17 reservoirs. Continue AMP and grazing system.
	LP 4,343							
Badlands 5848	LA 741	Spring/fall use.	L 409	Develop 1 reservoir. Reduce spring grazing by 328 AUMs to improve ecological condition.	L 780	Develop 3 reservoirs.	L 741	Develop 3 reservoirs.
	LP 780					Spring/fall use.		Develop grazing system.
Baaser Wash 5832	LA 1,113	Season long use.	L 832	Reduce spring grazing by 275 AUMs to improve ecological condition.	L 1,254	Develop AMP and grazing system.	L 1,113	Develop AMP and grazing system.
	LP 1,254							
Bohemian Bottoms 5840	LA 617	Season long use.	L 576	Reduce spring grazing by 38 AUMs to improve ecological condition.	L 617	Develop 2 reservoirs. Season long use.	L 612	Develop 2 reservoirs. Season long use.
	LP 617							
Bonanza 5842	LA 1,827	Season long use.	L 1,462	Reduce spring grazing by 355 AUMs to improve ecological condition.	L 1,952	Develop AMP and grazing system.	L 1,827	Develop AMP and grazing system.
	LP 1,952							
Brewer 5831	LA 120	Season long use.	L 90	Reduce spring grazing by 30 AUMs to improve ecological condition.	L 122	Season long use.	L 120	Season long use.
	LP 120							
Cocklebur 5833	LA 1,167	Season long use.	L 843	Reduce competition with wildlife by 59 AUMs. Reduce spring grazing by 259 AUMs to improve ecological condition.	L 1,746	Develop AMP and grazing system.	L 1,167	Develop AMP and grazing system.
	LP 1,746							



Allotment Name Allotment Num.	Current Management		Resource Protection		Commodity Production		Balanced Use	
	Use(a) Level AUMs	Management Actions	Use(a) Level AUMs	Management Actions	Use(a) Level AUMs	Management Actions	Use(a) Level AUMs	Management Actions
Halfway Hill 5861	LA 558	Season long use.	L 462	Reduce spring grazing by 93 AUMs to improve ecological condition.	L 558	Develop AMP and grazing system.	L 553	Develop AMP and grazing system.
	LP 558							
Hells Hole 8819	LA 1,511	Season long use.	L 1,322	Develop 1 spring. Reduce spring grazing by 169 AUMs to improve ecological condition.	L 4,014	Develop 3 reservoirs. Develop 1 spring. Build 2.5 miles of fence. Season long use.	L 1,511	Develop 3 reservoirs. Develop 1 spring. Season long use.
	LP 4,014							
Jensen 5836	LA 689	Spring-fall use.	L 379	Reduce competition with wildlife by 115 AUMs. Develop 1 spring. Reduce spring grazing by 192 AUMs to improve ecological condition.	L 696	Develop 1 spring. Develop grazing system.	L 689	Develop 1 spring. Develop grazing system.
	LP 696							
K Ranch(c) 5849	LP 238	-	-	-	-	-	-	-
Kane Hollow 5837	LA 379	Spring-fall use.	L 357	Develop 1 reservoir. Reduce spring grazing by 20 AUMs to improve ecological condition.	L 428	Develop 1 reservoir. Develop grazing system.	L 379	Develop 1 reservoir. Develop grazing system.
	LP 428							
Little Emma 5852	LA 3,536	Season long use.	L 2,733	Develop 3 reservoirs. Reduce spring grazing by 707 AUMs to improve ecological condition.	L 4,545	Develop 5 reservoirs. Season long use.	L 3,536	Develop 5 reservoirs. Season long use.
	LP 4,545							
Miners Gulch 5838	LA 100	Season long use.	L 32	Reduce competition with wildlife by 17 AUMs. Reduce spring grazing by 50 AUMs to improve ecological condition.	L 154	Season long use.	L 100	Season long use.
	LP 154							



Allotment Name Allotment Num.	Current Management		Resource Protection		Commodity Production		Balanced Use	
	Use(a) Level AUMs	Management Actions	Use(a) Level AUMs	Management Actions	Use(a) Level AUMs	Management Actions	Use(a) Level AUMs	Management Actions
Olsen AMP 8816	LA 3,344	Continue AMP and grazing system.	L 2,408	Adjust AMP and grazing system to reflect change in spring use. Reduce spring grazing by 809 AUMs to improve ecological condition.	L 9,534	Continue AMP and grazing system.	L 3,344	Continue AMP and grazing system.
	LP 9,208							
Powder Wash 5857	LA 1,905	Season long use.	L 1,473	Reduce competition with wildlife by 64 AUMs. Develop 1 reservoir. Reduce spring grazing by 358 AUMs to improve ecological condition.	L 2,100	Develop 3 reservoirs. Develop AMP and grazing system.	L 1,905	Develop 3 reservoirs. Develop AMP and grazing system.
	LP 2,100							
Raven Ridge 5851	LA 1,038	Season long use.	L 825	Reduce spring grazing by 208 AUMs to improve ecological condition.	L 1,175	Control burn or spray 1,000 acres. Season long use.	L 1,101	Control burn or spray 1,000 acres. Season long use.
	LP 1,112							
Sand Wash 8818	LA 1,858	Season long use.	L 1,513	Reduce spring grazing by 310 AUMs to improve ecological condition.	L 7,134	Season long use.	L 1,858	Season long use.
	LP 7,025							
Seven Sisters AMP 5845	LA 1,123	Continue AMP and grazing system.	L 1,012	Adjust AMP and grazing system to reflect change in season of use and wild horse use. Reduce spring grazing by 102 AUMs to improve ecological condition.	L 1,920	Continue AMP and grazing system.	L 1,123	Continue AMP and grazing system.
	LP 1,920							
	WH 60	Present management.	WH 60	Maximize wild horse use.	WH 0	Eliminate wild horse use.	WH 0	Eliminate wild horse use.



Allotment Name Allotment Num.	Current Management		Resource Protection		Commodity Production		Balanced Use	
	Use(a) Level AUMs	Management Actions	Use(a) Level AUMs	Management Actions	Use(a) Level AUMs	Management Actions	Use(a) Level AUMs	Management Actions
Snake John 5860	LA 1,013 LP 1,164	Season long use.	L 811	Reduce spring grazing by 196 AUMs to improve ecological condition.	L 1,164	Develop AMP and grazing system.	L 1,013	Develop AMP and grazing system.
Spring Hollow 5862	LA 444 LP 444	Spring-fall use.	L 220	Develop 1 reservoir. Reduce spring grazing by 222 AUMs to improve ecological condition.	L 444	Develop 3 reservoirs. Spring-fall use.	L 441	Develop 3 reservoirs. Develop grazing system.
Stateline 5863	LA 1,245 LP 2,516	Season long use.	L 1,057	Reduce spring grazing by 175 AUMs to improve ecological condition.	L 2,516	Season long use.	L 1,245	Season long use.
Stirrup AMP 5847	LA 413 LP 413	Continue AMP and grazing system.	L 336	Adjust AMP and grazing to reflect change in spring use. Reduce spring grazing by 75 AUMs to improve ecological condition.	L 413	Continue AMP and grazing system.	L 406	Evaluate and revise AMP and grazing system and season of use.
Sunday School Canyon AMP 8814	LA 2,998 LP 3,777	Continue AMP and grazing system.	L 2,559	Develop 1 guzzler. Adjust AMP and grazing system to reflect change in spring use. Reduce spring grazing by 427 AUMs to improve ecological condition.	L 3,799	Develop 3 guzzlers. Build 1/4 mile of pipeline. Evaluate and revise AMP and grazing system to account for additional waters.	L 2,998	Develop 6 guzzlers. Build 1/4 mile of pipeline. Evaluate and revise AMP and grazing system to account for additional waters.
Walker Hollow AMP 5839	LA 735 LP 767	Continue AMP and grazing system.	L 731	Develop 1 spring. Build 1/2 miles of fence. Continue AMP and grazing system.	L 767	Develop 2 reservoirs. Develop 1 spring. Build 1/2 mile fence. Revise AMP and grazing system to account for additional water and fence.	L 735	Develop 2 reservoirs. Develop 1 spring. Build 1/2 mile fence. Revise AMP and grazing system to account for additional waters and fence.



Allotment Name Allotment Num.	Current Management		Resource Protection		Commodity Production		Balanced Use	
	Use(a) Level AUMs	Management Actions	Use(a) Level AUMs	Management Actions	Use(a) Level AUMs	Management Actions	Use(a) Level AUMs	Management Actions
Watson 8815	LA 1,258	Season long use.	L 1,035	Develop 1 reservoir. Reduce spring grazing by 210 AUMs to improve ecological condition.	L 1,299	Develop 3 reservoirs. Season long use.	L 1,249	Develop 3 reservoirs. Season long use.
	LP 1,258							
West Deadman 5841	LA 1,095	Season long use.	L 889	Reduce spring grazing by 197 AUMs to improve ecological condition.	L 1,942	Season long use.	L 1,095	Season long use.
	LP 1,942							
White River 8829	LA 190	Season long use.	L 189	Season long use.	L 190	Season long use.	L 189	Season long use.
	LP 190							
White River Bottoms 5850	LA 479	Season long use.	L 0	Restrict livestock from entire allotment to protect riparian habitat and flood- plains.	L 480	Season long use.	L 479	Season long use.
	LP 480							



Allotment Name Allotment Num.	Current Management		Resource Protection		Commodity Production		Balanced Use	
	Use(a) Level AUMs	Management Actions	Use(a) Level AUMs	Management Actions	Use(a) Level AUMs	Management Actions	Use(a) Level AUMs	Management Actions
LOCALITY SUMMARY	LA 37,352	Continue season long use on 19 allotments. Continue spring-fall use on four allotments. Continue AMPs and grazing systems on 6 allotments. One allotment managed by Colorado.	L 29,191	Reduction of livestock preference to average use = 24,209 AUMs (this includes 600 AUMs for wild horse use and 1,390 AUMs for antelope). Decrease 255 AUMs for wildlife in herd unit 26. Decrease 6,918 AUMs of spring use to improve ecological condition. Decrease 479 AUMs to protect riparian habitat and 100-year floodplains. Reduce 509 AUMs from mineral impacts to livestock. Develop 17 reservoirs and 3 springs. Build 1 guzzler and 1/2 mile of fence. Adjust 5 AMPs and grazing systems to reflect the above changes. Continue 1 AMP and grazing system. One allotment managed by Colorado.	L 62,026	Develop 41 reservoirs. Develop 3 springs. Build 3 miles of fence. Build 3 guzzlers. Build 1/4 mile of pipeline. Control burn or chemically treat 1,000 acres. Develop 7 AMPs and grazing systems. Develop 2 grazing systems. Continue 4 AMPs and grazing systems. Evaluate and revise 2 AMPs and grazing systems. One allotment managed by Colorado.	L 37,385	Develop 46 reservoirs. Develop 3 springs. Build 6 guzzlers. Build 1/2 mile of fence. Build 1/4 mile of pipeline. Control burn or spray 1,000 acres. Develop 7 AMPs. Develop 11 grazing systems. Continue 4 AMPs and grazing systems. Evaluate and revise 2 AMPs and grazing systems. One allotment managed by Colorado.
	LP 61,323	Present management	WH 600	Maximize wild horse use on 2 allotments.	WH 0	Eliminate wild horse use on 2 allotments.	WH 0	Eliminate wild horse use on 2 allotments.



Allotment Name Allotment Num.	Current Management		Resource Protection		Commodity Production		Balanced Use	
	Use(a) Level AUMs	Management Actions	Use(a) Level AUMs	Management Actions	Use(a) Level AUMs	Management Actions	Use(a) Level AUMs	Management Actions
BOOK CLIFFS LOCALITY								
Atchee Ridge AMP 8824	LA 7,074 grazing system.		L 6,465	Reduce spring grazing by 590 AUMs. To improve ecological condition. Develop 6 springs. Build 2 guzzlers. Control burn 5,300 acres. Adjust AMPs and grazing system to allow for changes listed above.	L 11,749	Develop 10 springs. Build 7 guzzlers. Build 15 miles of fence. Control burn 4,200 acres. Chain 1,400 acres. Revise AMP and grazing system to reflect additional developments.	L 7,074	Develop 11 springs. Build 10 guzzlers. Build 15 miles of fence. Control burn 5,000 acres. Revise AMP and grazing system to reflect additional developments.
	LP 9,447							
Book Cliff Pastures 8828	LA 300 Season long use.		L 299	Season long use.	L 301	Season long use.	L 300	Season long use.
	LP 301							
Davis Canyon(c) 8823	LA - LP 334		-	-	-	-	-	-
Horse Point(b) AMP 8825	LA 1,398 Continue AMP and grazing system.		L 1,206	Develop 2 reservoirs. Build 2 miles of fence. Control burn 2,000 acres. Clear cut 300 acres. Adjust AMP and grazing system to allow for changes listed above. Reduce spring grazing by 231 AUMs to improve ecological condition.	L 3,342	Build 3 guzzlers. Develop 3 reservoirs. Build 1 mile of fence. Control burn 2,900 acres. Revise AMP and grazing system to reflect additional developments.	L 1,398	Build 3 guzzlers. Develop 3 reservoirs. Build 1 mile of fence. Control burn or spray 2,000 acres. Revise AMP and grazing system to reflect additional developments.
	LP 2,346							
	WH 171 Present management.		WH 171	Maximize wild horse use.	WH 171	Year long use.	WH 171	Maximize wild horse use.



Allotment Name Allotment Num.	Current Management		Resource Protection		Commodity Production		Balanced Use	
	Use(a) Level AUMs	Management Actions	Use(a) Level AUMs	Management Actions	Use(a) Level AUMs	Management Actions	Use(a) Level AUMs	Management Actions
McClelland 8826	LA 1,226	Season long use.	L 1,023	Season long use. Reduce spring grazing by 196 AUMs to improve ecological condition.	L 1,399	Season long use.	L 1,226	Season long use.
	LP 1,399							
Sweetwater AMP 8822	LA 5,822	Continue AMP and grazing system.	L 5,226	Restrict livestock use on 210 acres (18 AUMs) of floodplains and riparian habitat. Restrict livestock use on critical wild- life habitat by 751 AUMs. Develop 2 springs. Build 2 guzzlers. Develop 2 reservoirs. Build 6 miles of fence for floodplain and riparian habitat protection. Build 2 miles of pipeline. Control burn 8,000 acres. Clear cut 300 acres. Adjust AMP and grazing system to allow for changes listed above.	L 8,815	Develop 2 springs. Develop 2 reservoirs. Build 3 guzzlers. Build 2 miles of pipe- line. Control burn 4,500 acres. Clear cut 300 acres. Revise AMP and grazing system to reflect additional development.	L 5,822	Develop 2 springs. Develop 2 reservoirs. Build 8 guzzlers. Build 2 miles of pipeline. Control burn 2,000 acres. Clear cut 300 acres. Revise AMP and grazing system to reflect additional developments. Restrict livestock from 210 acres (18 AUMs) of floodplains and riparian habitat.
	LP 7,276							
Westwater Point 8833	LA 349	Season long use.	L 347	Build 1 guzzler. Reduce spring grazing by 330 AUMs to improve ecological condition.	L 426	Build 1 guzzler. Season long use.	L 349	Build 1 guzzler. Season long use.
	LP 426							



Allotment Name Allotment Num.	Current Management		Resource Protection		Commodity Production		Balanced Use	
	Use(a) Level AUMs	Management Actions	Use(a) Level AUMs	Management Actions	Use(a) Level AUMs	Management Actions	Use(a) Level AUMs	Management Actions
Winter Ridge AMP 8827	LA 1,182	Continue AMP and grazing system.	L 848	Develop 3 reservoirs. Develop 2 springs. Control burn 100 acres. Adjust AMP and grazing system to allow for changes listed above.	L 2,353	Control burn or spray 1,200 acres. Revise AMP and grazing system to reflect additional developments.	L 1,182	Develop 3 reservoirs. Develop 2 springs. Control burn or spray 1,200 acres. Revise AMP and grazing system to reflect additional developments.
	LP 1,979 WH 108	Present management.	WH 0	Eliminate wild horse use.	WH 0	Eliminate wild horse use.	WH 0	Eliminate wild horse use.



Allotment Name Allotment Num.	Current Management		Resource Protection		Commodity Production		Balanced Use	
	Use(a) Level 1 AUMs	Management Actions	Use(a) Level 1 AUMs	Management Actions	Use(a) Level 1 AUMs	Management Actions	Use(a) Level 1 AUMs	Management Actions
LOCALITY SUMMARY	LA 17,351	Season long use = 3 allotments. AMPs and rotation grazing systems = 4 allotments. One allotment managed by Colorado.	L 15,412	Reduce spring grazing by 1,347 AUMs on 4 allotments to improve ecological condition. Restrict livestock on flood-plains and riparian habitat by 18 AUMs. Restrict livestock on critical wildlife habitat by 751 AUMs. Develop 10 springs. Develop 7 reservoirs. Build 5 guzzlers. Build 2 miles of fence for livestock. Build 6 miles of fence to protect riparian habitat and flood-plains. Build 2 miles of pipeline. Control burn 15,400 acres. Clear cut 600 acres. Adjust 4 AMPs and grazing systems to allow for changes listed.	L 28,385	Develop 12 springs. Develop 5 reservoirs. Build 14 guzzlers. Build 16 miles of fence. Build 2 miles of pipeline. Control burn 11,600 acres. Control burn or chemically treat 1,200 acres. Clear cut 300 acres. Chain 1,400 acres. Revise 4 AMPs and grazing systems to reflect developments. Season long use = 3 allotments.	L 17,351	Develop 16 springs. Develop 8 reservoirs. Build 22 guzzlers. Build 16 miles of fence. Build 2 miles of pipeline. Control burn 7,000 acres. Control burn or chemically treat 3,200 acres. Clear cut 300 acres. Revise 4 AMPs and grazing systems to reflect developments. Season long use on 3 allotments.
P 23,174 WH 108	Present management on one allotment.		WH 0	Eliminate wild horse use on 1 allotment.	WH 0	Eliminate wild horse use on 1 allotment.	WH 0	Eliminate wild horse use on 1 allotment.



Allotment Name Allotment Num.	Current Management		Resource Protection		Commodity Production		Balanced Use	
	Use(a) Level AUMs	Management Actions	Use(a) Level AUMs	Management Actions	Use(a) Level AUMs	Management Actions	Use(a) Level AUMs	Management Actions
HILL CREEK LOCALITY								
Birchell 8804	LA 85	Season long use.	L 0	Restrict livestock from entire allotment to protect riparian habitat and flood-plain.	L 93	Control burn 100 acres. Develop AMP and grazing system.	L 85	Control burn 100 acres. Develop AMP and grazing system.
	LP 85							
Green River AMP 8803	LA 436	Continue AMP and grazing system.	L 0	Restrict livestock from entire allotment to protect riparian habitat and flood-plains.	L 437	Continue AMP.	L 435	Continue AMP. Restrict livestock from 260 acres to protect 100-year floodplain and riparian habitat.
	LP 437							
Hatch-Broome- Bartholemew 8805	LA 107	Season long use.	L 53	Reduce spring grazing by 54 AUMs to improve watershed and ecological condition.	L 107	Season long use.	L 107	Season long use.
	LP 107		L 53					
Lower Shawalter (Wild horse Bench) 8811	LA 50	Season long use.	L 43	Season long use.	L 1,508	Season long use.	L 50	Season long use.
	LP 1,508							
	WH 84	Present management.	WH 180	Maximize wild horse use.	WH 0	Reduce wild horse use.	WH 180	Maximize wild horse use.
Oil Shale 8813	LA 0(d)	Season long use.	L 0(d)	Season long use.	L 1,098	Build 1 guzzler. Season long use.	L 0(d)	Build 1 guzzler. Season long use.
	LP 1,098							
	WH 90	Present management.	WH 90	Present wild horse use.	WH 0	Reduce wild horse use.	WH 180	Maximize wild horse use.



Allotment Name Allotment Num.	Current Management			Resource Protection			Commodity Production			Balanced Use		
	Use(a) Level AUMs	Management Actions	Use(a) Level AUMs	Management Actions	Use(a) Level AUMs	Management Actions	Use(a) Level AUMs	Management Actions	Use(a) Level AUMs	Management Actions	Use(a) Level AUMs	Management Actions
Pack Mountain- Wild Horse 8808	LA 1,328	Season long use.	L 1,187	Develop 2 reservoirs. Reduce spring grazing by 133 AUMs to improve ecological condition.	L 1,775	Develop 6 reservoirs. Build 1 guzzler. Season long use.	L 1,328	Develop 6 reservoirs. Build 1 guzzler. Season long use.	L 1,328	Develop 6 reservoirs. Build 1 guzzler. Season long use.		
	LP 1,775											
	WH 120	Present management.	WH 120	Maximize wild horse use.	WH 0	Reduce wild horse use.	WH 120	Maximize wild horse use.	WH 120	Maximize wild horse use.		
Santio Sibello 8806	LA 96	Season long use.	L 80	Reduce spring grazing by 16 AUMs to improve ecological condition.	L 96	Build 1.5 miles of fence. Season long use.	L 96	Build 1.5 miles of fence. Season long use.	L 96	Build 1.5 miles of fence. Season long use.		
	LP 96											
Tabyago 8801	LA 1,997	Season long use.	L 1,792	Develop 1 reservoir. Reduce spring grazing by 200 AUMs to improve ecological condition.	L 2,995	Develop 2 reservoirs. Build 2 guzzlers. Control burn 600 acres. Season long use.	L 1,997	Develop 2 reservoirs. Build 2 guzzlers. Season long use.	L 1,997	Develop 2 reservoirs. Build 2 guzzlers. Season long use.		
	LP 2,995											
	WH 540	Present management.	WH 660	Maximize wild horse use.	WH 140	Reduce wild horse use.	WH 660	Maximize wild horse use.	WH 660	Maximize wild horse use.		
Thorne-Ute- Broome 8812	LA 248	Season long use.	L 123	Reduce spring grazing by 124 AUMs to improve ecological condition.	L 248	Season long use.	L 247	Season long use.	L 247	Season long use.		
	LP 248											
Upper Showalter (Mustange) 8810	LA 133	Season long use.	L 66	Reduce spring grazing by 67 AUMs to improve ecological condition.	L 398	Control burn or spray 1,100 acres. Season long use.	L 133	Control burn or spray 500 acres. Season long use.	L 133	Control burn or spray 500 acres. Season long use.		
	LP 398											
	WH 120	Present management.	WH 180	Maximize wild horse use.	WH 117	Reduce wild horse use.	WH 180	Maximize wild horse use.	WH 180	Maximize wild horse use.		
Ute 8809	LA 488	Season long use.	L 400	Reduce spring grazing by 81 AUMs to improve ecological condition.	L 1,474	Control burn or spray 500 acres. Season long use.	L 488	Season long use.	L 488	Season long use.		
	LP 1,464											
	WH 96	Present management.	WH 216	Maximize wild horse use.	WH 24	Reduce wild horse use.	WH 216	Maximize wild horse use.	WH 216	Maximize wild horse use.		



Allotment Name Allotment Num.	Current Management		Resource Protection		Commodity Production		Balanced Use	
	Use(a) Level AUMs	Management Actions	Use(a) Level AUMs	Management Actions	Use(a) Level AUMs	Management Actions	Use(a) Level AUMs	Management Actions
West Tabyago AMP 8807	LA 1,474	Continue present AMP and grazing system.	L 1,308	Reduce spring grazing by 164 AUMs to improve ecological condition.	L 2,420	Control burn 1,500 acres. Evaluate and revise AMP to account for wild horse use and land treatment.	L 1,474	Evaluate and revise AMP to account for wild horse use.
	LP 2,420							
	WH 660	Present management.	WH 720	Maximize wild horse use.	WH 258	Reduce wild horse use.	WH 720	Maximize wild horse use.
LOCALITY SUMMARY	LA 6,442	Continue season long use on 10 allotments. Continue AMPs and grazing systems on 2 allotments.	L 5,045	Reduce spring grazing by 839 AUMs on 8 allotments to improve ecological condition. Restrict livestock from 2 allotments to protect riparian habitat and flood- plains. Develop 3 reservoirs.	L 12,649	Develop 8 reservoirs. Build 4 guzzlers. Build 1.5 miles of fence. Control burn 2,200 acres. Control burn or spray 1,600 acres. Develop 1 AMP. Evaluate and revise 1 AMP to account for wild horse use. Continue 1 AMP. Continue season long use on 9 allotments.	L 6,440	Develop 8 reservoirs. Build 4 guzzlers. Build 1.5 miles of fence. Control burn or spray 600 acres. Evaluate and revise 1 AMP to account for wild horse use. Develop 1 AMP. Continue 1 AMP. Continue season long use on 9 allotments.
	LP 12,631							
	WH 1,881	Present management for wild horses on 8 allotments.	WH 2,340	Wild horse use would be maximized on 8 allotments.	WH 710	Reduced wild horse use on 7 allotments. Present use on 1 allotment.	WH 2,340	Maximize wild horse use on 8 allotments.



Allotment Name Allotment Num.	Current Management		Resource Protection		Commodity Production		Balanced Use	
	Use(a) Level AUMs	Management Actions	Use(a) Level AUMs	Management Actions	Use(a) Level AUMs	Management Actions	Use(a) Level AUMs	Management Actions
RESOURCE AREA SUMMARY	LA 66,980 LP 102,915	Continue 13 AMPs and grazing systems. Con- tinue present grazing levels on 41 allotments.	L 53,373 L 109,485	Reduce spring grazing on 44 allotments amounting to 10,172 AUMs to improve ecological condition. Revise 10 AMPs to reflect changes in spring grazing. Reduce competition with wildlife on 10 allotments resulting in 1,031 AUMs in herd unit 26. Restrict livestock on 14,924 acres amount- ing to 1,168 AUMs of riparian habitat and floodplains. Restrict livestock from 14,000 acres of critical wildlife habitat amounting to 751 AUMs. Develop 14 springs. Develop 31 reservoirs. Build 6 guzzlers. Build 10 miles of fence. Build 3 miles of pipeline. Control burn 15,400 acres. Clear cut 600 acres.	L 109,485 L 109,485	Develop 11 AMPs with 2 additional grazing systems. Continue 6 AMPs and revise 7. Continue present management on 8 allot- ments. Develop 16 springs. Develop 62 reservoirs. Build 21 guzzlers. Build 18 miles of fence. Build 4 miles of pipeline. Control burn 13,000 acres. Spray or con- trol burn 6,300 acres. Chain 1,400 acres. Clear cut 300 acres.	L 66,887 L 66,887	Develop 11 AMPs and 4 additional grazing systems to defer spring grazing. Continue 6 AMPs and grazing systems. Revise 7 AMPs and grazing systems to defer or rest spring grazing. Continue present management on 26 allotments. Develop 20 springs. Develop 66 reservoirs. Build 32 guzzlers. Build 18 miles of fence. Build 3 miles of pipeline. Control burn 8,050 acres. Spray or control burn 10,900 acres. Clear cut 300 acres. Restrict livestock from 470 acres of riparian habitat and floodplain.
	WH 2,469	Present management for wild horses on 11 allotments.	WH 2,337	Maximize wild horse use on 10 allotments. Eliminate wild horse use on 1 allotment.	WH 710	Reduce wild horse use on 7 allotments. Eliminate wild horse use on 3 allotments. Continue present wild horse use on 1 allot- ment.	WH 2,340	Maximize wild horse use on 8 allotments. Eliminate wild horse use on 3 allotments.







# **APPENDIX 6** **CAMPSITES IDENTIFIED IN PREVIOUS YEARS FOR** **POSSIBLE DEVELOPMENT**

Name	Location - Size	Features	Present Status	Future Potential
Hide Out Campground	T14S, R23E, Sec. 30 SW $\frac{1}{4}$ SE $\frac{1}{4}$ ; Size: 40 Acres	Adjacent to Seep Ridge Road and about 1 mile south of Pine Springs Canyon turnout. Canyon head, ponderosa pine provides shade, terrain-relatively level, no water.	Ponderosa stand partially cut around 1960 but sufficient number of trees remain to provide adequate shade & screening.	Easy access from Seep Ridge Road. Presently used by hunters for camping.
Seep Ridge Hunter Camp	T15S, R22E, Sec. 8 NE $\frac{1}{4}$ SE $\frac{1}{4}$ , N $\frac{1}{2}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ Size: 60 Acres	Located on flat ground contiguous to the Seep Ridge Road. Past use has been deer hunters that camp under mature pinyon trees.	Gas well drilled in 1981 on the northern half of the camp area. Road built through area to access other gas wells. Dusty. Lack of privacy.	Aesthetic value of the area has been nearly ruined. Seldom used today by hunters.
Meadow Ridge	T15S, R23E, Sec. 21 S $\frac{1}{2}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$ , Sec. 28 NE $\frac{1}{4}$ NW $\frac{1}{4}$ ; Size: 60 Acres	Located at the head of a canyon. Vegetated by a stand of Douglas fir. No water. Terrain-undulating.	Access road to this area has been upgraded to a gas well service road. Road has been extended and passes thru the center of the unit.	Future potential for development is low to moderate. Road construction has removed many of the key shade trees. Feeling of solitude reduced by the presence of the road.



Appendix 6 (Continued)

Name	Location - Size	Features	Present Status	Future Potential
Willow Canyon Hunter Camp	T16S, R24E, Sec. 4 NE $\frac{1}{4}$ NE $\frac{1}{4}$ T15 $\frac{1}{2}$ S, R24E, Sec. 33 S $\frac{1}{2}$ SE $\frac{1}{4}$ SE $\frac{1}{4}$ Size: 60 Acres	Located at the top of the Book Cliffs Mountains at the head of Willow Canyon. No water present other than a stock pond. Two-acre stand of aspen trees in the unit. Slopes north facing. Terrain moderately steep.	Mountain Fuel natural gas pipeline buried across the southern edge of the unit. Stock pond built in the middle of the unit is heavily used by cows. This camp is located within one mile of PR Spring.	Little potential for future development. Unit competes with PR Spring and South Canyon for camping use. The soil on the north slope is slow to dry.
PR Spring	T15S, R23E, Sec. 36 SE $\frac{1}{4}$ SE $\frac{1}{4}$ T15S, R24E, Sec. 31 SW $\frac{1}{4}$ SW $\frac{1}{4}$ Size: 80 Acres	Only recreation site available on public land with a dependable supply of water. Site very popular for both camping & culinary water. Remnant of old CCC camp still present.	Spring redeveloped in 1979. Fence and cattle guard installed in 1982.	Water source dependable and of excellent quality. Good access road. Good future potential for rest area, water site & picnic area. Lack of adequate space makes site less desirable for a campground.



# Appendix 6 (Continued)

Name	Location - Size	Features	Present Status	Future Potential
Aspen Hollow	T16S, R24E, Sec. 3 E $\frac{1}{2}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$ Size: 20 Acres	Located at the head of South Canyon in a small grove of aspen trees. Site accommodates only one camping unit without major dirt work. Terrain is steep.	Mountain Fuel natural gas line built through the southern edge of the unit in the late 60's.	Expensive to develop because terrain is relatively steep. Historically, site is occupied during the hunting season by one party. Future potential-mod-erate.
Chicken Spring	T15 $\frac{1}{2}$ S, R24E, Sec. 34 NW $\frac{1}{4}$ SE $\frac{1}{4}$ , E $\frac{1}{2}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$ Size: 100 Acres	One of the best areas in South Canyon to camp. Popular area for hunters. No improvements have been made to the site.	Some aspen trees have been killed due to abuse by campers. Erosion a small problem as a result of silt washing off road into the area. Area on the west side of the road may not be suited or needed for development.	Development potentially moderately high. Problems: dust from South Canyon road drifts into area, no water available, cattle graze this area hard in the summer.
South Canyon Hunter Camp	T15S, R24E, Sec. 28 E $\frac{1}{2}$ SE $\frac{1}{4}$ SW $\frac{1}{4}$ , W $\frac{1}{2}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$ Size: 40 Acres	Located about one mile down canyon from BLM's administrative camp located in South Canyon. A few aspen trees are present.	Trench about ten feet deep eroded in the bottom of the canyon and divides the site in two. Can be dusty from road traffic.	In the past seven years, it has not proved to be a popular place to camp. Close to PR



Appendix 6 (Continued)

Name	Location - Size	Features	Present Status	Future Potential
Book Cliffs Rim Hunter Camp	T16S, R25E, Sec. 5 SW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ , NW $\frac{1}{4}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$ Sec. 6 S $\frac{1}{2}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ N $\frac{1}{2}$ SE $\frac{1}{4}$ NE $\frac{1}{4}$ Size: 60 Acres	Located on a high ridge top overlooking the Book Cliffs to the south and north. No water available. Douglas fir overstory with mountain mahogany and grasses underneath. Contiguous to Book Cliffs divide road.	Trampling of vegetation & soil compaction has caused site deterioration. Tree roots exposed. Has received heavy use in past years but recently due to increased traffic & dust, it has lost some popularity.	Trees provide good shade. Site can be very dusty from road traffic. Room for development of additional sites limited. Moderately high future potential.
Lee Canyon Hunter Camp	T15S, R26E Sec. 18 Lot #4 Sec. 19 Lot #1 Size: 105 Acres	Located at the bottom of a small deep canyon, Lee Canyon.	BLM developed the spring in 1981 for livestock use. Small aspen grove. Seldom used by campers. Road has been eroded away. Conflicts with cattle grazing and preservation of good wildlife habitat.	Site is somewhat isolated and not known by most hunters. Low future potential.



# Appendix 6 (Continued)

Name	Location - Size	Features	Present Status	Future Potential
Lower McCook Hunter Camp	T14S, R24E, Sec. 4 SE $\frac{1}{4}$ NW $\frac{1}{4}$ , NE $\frac{1}{4}$ SE $\frac{1}{4}$ NW $\frac{1}{4}$ SE $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ , SW $\frac{1}{4}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ Size: 70 Acres	Located on top of a large flat ridge on Lower McCook. No water. Vegetation is pinyon-juniper and sagebrush.	In the mid 1960's, this area was chained. Only a few trees on sloping terrain remain.	Lack of shade & chaining has destroyed the aesthetic appeal of the site.
Flat Rock Hunter Camp (Massey Junction)	T13S, R25E Sec. 5 SE $\frac{1}{4}$ SW $\frac{1}{4}$ Sec. 8 NE $\frac{1}{4}$ NW $\frac{1}{4}$ Size: 80 Acres	Located on Atchee Ridge at Massey Junction. Mature stand of pinyon-juniper.	Area being used as an administrative site by BLM and Division of Wildlife Resources. Cabin was built by DWR in 1976. BLM maintains a trailer at the site.	Has proven to be a good administrative site. Limited demand by the public to camp here.
Atchee Ridge	T13S, R25E, Sec. 27 SE $\frac{1}{4}$ NE $\frac{1}{4}$ Size: 40 Acres	Located on Atchee Ridge adjacent to the road and one mile south on the Indian Spring Ridge turnout. The site is situated on a ridge top with the terrain sloping away on three sides. Mature pinyon and junipers present.	No site deterioration since the area was inventoried in the 1960's. Hunters still camp in the area.	No other areas reserved along the Atchee road. However, there are many good opportunities for dispersed camping on the many side roads.
Winter Ridge	T15S, R22E, Sec. 33 NW $\frac{1}{4}$ SW $\frac{1}{4}$ Size: 40 Acres		Area reviewed by the Area Manager and dropped from protective status on 10/21/81.	



Appendix 6 (Continued)

Name	Location - Size	Features	Present Status	Future Potential
Point of Pines Hunter Camp	T5S, R25E, Sec. 22 SW $\frac{1}{4}$ NW $\frac{1}{4}$ Size: 40 Acres	Scattered ponderosa pine. Terrain relatively flat. No water available.	Forest fire burned to the edge of the site in 1974. Access or con- ditions of the site has not changed since it was originally in- ventoried.	Site duplica- tes Point of Pines Over- look. Tra- ditionally, hunters camp in the vicinity of the small pond and not at this site.



## APPENDIX 7

### SCENIC OVERLOOKS AND GEOLOGIC FEATURES

Name	Location - Size	Features	Present Status	Future Potential
Point of Pines Picnic Site and Scenic Overlook	T5S, R25E, Sec. 20 S $\frac{1}{2}$ ; Size: 320 Acres	Located on top of Blue Mountain near the edge of a 2000 feet cliff. Terrain relatively flat and soils sandy. No water. Site contains a small pond which dries up in the summer. Vegetation is ponderosa pine, aspen and an understory of manzanita. Excellent view on the eastern edge of the Uintah Basin.	Forest fire burned & killed much of the vegetation along the rim of Blue Mountain. However, most of this site was spared from the fire.  Mainly used by hunters and sightseers.	This site can be improved by adding the NW $\frac{1}{4}$ , Sec. 29, T5S, R25E. High quality site with future potential.
Doc's Valley Picnic Site and Scenic Overlook	T4S, R25E, Sec. 30 S $\frac{1}{2}$ SE $\frac{1}{4}$ , SE $\frac{1}{4}$ SW $\frac{1}{4}$ , Sec. 31 N $\frac{1}{2}$ NE $\frac{1}{4}$ , NE $\frac{1}{4}$ NW $\frac{1}{4}$ Size: 240 Acres	Located on Blue Mountain between Doc's Valley and Daniels Canyon. No water available. Vegetation: Scattered ponderosa pine, pinyon and juniper with sagebrush understory.	Portion of Doc's Valley sprayed to kill the sagebrush and enhance the growth of grass. Deer hunters camp in this area. A small stock pond has been built on the southeast corner of the site.	The area is remote. Though the area is scenic and topographically interesting, it is not used by picknickers or sightseers. Panorama view is not outstanding when compared to Point of Pines.



Appendix 7 (Continued)

Name	Location - Size	Features	Present Status	Future Potential
Musket Shot Spring Interpretive Facility	Seven miles east of Jensen on Highway 40. T6S, R24E, Sec. 9 SW $\frac{1}{4}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$ Size: 10 Acres	<ol style="list-style-type: none"> <li>1. Parking area plus barriers for 6 cars.</li> <li>2. Four large interpretive signs dealing with Dominguez/Escalante expedition and geology of Blue Mountain. Signs located under a 8x10 wood ramada.</li> <li>3. Two advance notice signs one mile prior to the pull off.</li> <li>4. This site was constructed as a part of the bicentennial celebration and commemorates a segment of the Escalante Trail created by the Spanish Missionaries Dominguez &amp; Escalante in September 1776.</li> </ol>	<p>Site operated since 1976</p> <p>Problems encountered:</p> <ol style="list-style-type: none"> <li>1. No gates to close the area during the winter months.</li> <li>2. Vandalism of the signs.</li> <li>3. Pull through road is not paved.</li> <li>4. People dump trash at site.</li> <li>5. No sanitation facilities.</li> <li>6. Annual maintenance required - <math>\frac{1}{2}</math> work month.</li> </ol>	<p>Benefits of the site:</p> <ol style="list-style-type: none"> <li>1. Convenient pull off from a transcontinental highway.</li> <li>2. High percentage of out-of-state users during tourist season.</li> <li>3. Excellent view of the face of Blue Mountain.</li> <li>4. Has high future potential.</li> <li>5. Has high value for interpretive displays.</li> </ol>



Appendix 7 (Continued)

Name	Location - Size	Features	Present Status	Future Potential
Willow Creek Overlook	T11S, R21E, Sec. 19 SE $\frac{1}{4}$ SE $\frac{1}{4}$ ; Sec. 20 W $\frac{1}{2}$ SW $\frac{1}{4}$ SW $\frac{1}{4}$ ; Sec. 30 E $\frac{1}{2}$ NE $\frac{1}{4}$ NE $\frac{1}{4}$ Size: 80 Acres	Breathtaking view of Willow Creek drainage, Big Pack & Little Pack Mountains.	Site is located approximately $\frac{1}{4}$ mile north from the presently used overlook area. MFP recommendation has been approved allowing no incompatible uses or improvements on or adjacent to the overlook.	If the Seep Ridge road should be upgraded to an all-weather highway, this site could become increasingly important to the recreational experience of those travelling the area. This overlook typifies the little known beauty of this area to sightseers.
Grand Valley Overlook	T15S, R25E, Sec. 26 SE $\frac{1}{4}$ SW $\frac{1}{4}$ NW $\frac{1}{4}$ , SW $\frac{1}{4}$ SE $\frac{1}{4}$ NW $\frac{1}{4}$ , NE $\frac{1}{4}$ NW $\frac{1}{4}$ SW $\frac{1}{4}$ , NW $\frac{1}{4}$ NE $\frac{1}{4}$ SW $\frac{1}{4}$ , Size: 40 Acres	An excellent panoramic view of the Grand Valley of Colorado looking towards Grand Junction.	Loop road constructed to Observation Point. No sign marking the turnout.	Excellent view. Visitor use is low because of low volume of road traffic. No present conflicts with other land uses.



Appendix 7 (Continued)

Name	Location - Size	Features	Present Status	Future Potential
Split Mountain Overlook	T4S, R25E, Sec. 20 SW $\frac{1}{4}$ NW $\frac{1}{4}$ Size: 40 Acres	Located on Blue Mountain, one mile north of Doc's Valley. Rocky sparsely vegetated knoll view down into Split Mountain Canyon. Poor access via a rocky, dirt road.	No change since the area was inventoried in the 1960's.	Overlook is in a remote, out-of-the-way location. It is seldom visited. Better views of Split Mountain Canyon are available from inside Dinosaur National Monument from the Yampa Plateau, two miles to the west.
Fantasy Canyon Geologic Feature	T9S, R22E, Sec. 12 E $\frac{1}{2}$ NW $\frac{1}{4}$ NW $\frac{1}{4}$ , NE $\frac{1}{4}$ NW $\frac{1}{4}$ Size: 60 Acres	Located adjacent to Coyote Wash. Contains unique geological and erosional feature.	Not protected against mineral entry. Erosion features are very fragile and subject to vandalism.	A unique area with high development potential.
Duck Rock	T10S, R24E, Sec. 12 NW $\frac{1}{4}$ SW $\frac{1}{4}$ SE $\frac{1}{4}$ Size: 10 Acres	It is a rock in the shape of a duck and has become a local land mark.	Not protected against mineral entry or other type of development.	Adjacent to paved road. Has unique shape. Can be protected from degradation and has recreation potential for preservation.



# **APPENDIX 8**

## **MITIGATING MEASURES FOR LAND TREATMENTS WATER DEVELOPMENTS, AND MANAGEMENT FACILITIES**

### **Prescribe Burns**

The pattern of vegetation modification would be designed to blend into the landscape to maintain the natural appearance of the area and minimize impacts to the visual resources.

Soil moisture and the season of the burn would be selected to benefit the survival of desired species.

Fire lines and breaks would be built in conformance with the district fire plan. Following treatment, fire lines would be rehabilitated, berms smoothed, disturbed areas reseeded, etc. as necessary to conform to the original conformation of the site.

Burning would be conducted in such a manner as to allow convection to vent smoke and provide the most complete combustion of material, thus restricting air pollution.

In order to protect known cultural values and threatened, endangered, and sensitive plant and animal species, a clearance would be required prior to burning.

The need for buffer zones to protect critical wildlife habitat would be coordinated with the UDWR.

Care will be taken to locate and protect all legal markers including cadastral, property, and claim markers.

Protection of the watershed would be considered to protect the loss of soil. Gully plugging, reseeded, and other watershed preserving practices would be applied when warranted.

Permittees might have to defer grazing in some rangeland for periods of up to three years. Temporary fencing would be used to protect certain sites.

### **Chemical Treatment**

Projects would conform to State and Environmental Protection Agency (EPA) pollution standards. Application of chemicals would conform to EPA regulations and BLM requirements.

The patterns of the vegetation modification would be designed to blend into the landscape to maintain the natural appearance of the area.



## Appendix 8 (Continued)

In order to control drift, chemical sprays would be applied only when winds are less than 5 miles per hour.

The need for and proper dimensions of buffer zones to protect wildlife habitat would be jointly agreed upon by the BLM and UDWR.

Chemically treated vegetation would be left in place, with the exception of woodland products, which could be profitably harvested.

Season of treatment and soil moisture would be selected to give the best kill to target species and preserve desired species.

In order to protect known cultural values, threatened, endangered, and sensitive plant and animal species, a clearance would be required prior to treatment.

Visual resources would be considered in the development of the treatment area.

Care would be taken to locate and protect all legal markers including cadastral, property, and claim markers.

Cooperation with the range user would be maintained to protect treated areas from grazing following treatment. Deferrals in grazing would generally be one to three growing seasons. Where grazing systems with rest periods in the grazing cycle are being followed, treatments and deferral of use would be worked in with the normal rest periods in the grazing cycle.

### Chainings

The patterns of the vegetation modification would be designed to blend into the landscape to maintain the natural appearance of the area. Irregular patterns would be implemented to increase the edge effect.

Areas within 200 feet of well-traveled roads would not be chained.

Steep drainages (over 30 percent slope) would not be chained.

The need for and proper dimensions of buffer zones would be jointly agreed to by BLM and the Utah Division of Wildlife Resources (UDWR) prior to on-the-ground development of projects. Buffer zones would be provided, where necessary, to prevent disturbance to riparian ecosystem.

Vegetation would be left in place. Permits would be given for salvage of woodland products following treatment.

Seed from a mixture of plant species adapted to the specific site would be used for seeding. The mixture would be a variety of browse, forbs, and grass species that are desirable for both livestock and wildlife.

Treatment areas would not be grazed by livestock until vegetation becomes established. In most cases, two growing seasons of rest would be required.



## Appendix 8 (Continued)

In order to protect known cultural values, threatened, endangered, and sensitive plant and animal species, a clearance would be required prior to chaining.

Care would be taken to locate and protect all legal markers including cadastral, property, and claim markers.

### Clear Cuts

All trees with a stump of over 3 inches would be cut, except for those marked for wildlife use.

Cutting and harvesting areas would be closed when weather conditions would result in excessive erosion, soil compaction, and rutting of roads.

Stump height would not exceed 12 inches.

In order to protect known cultural values, threatened, endangered, and sensitive plant and animal species, a clearance would be required prior to cutting.

### Reservoir

In order to protect known cultural values, threatened, endangered, and sensitive plant and animal species, a clearance would be required prior to construction.

The borrow areas and reservoir dykes would be revegetated.

BLM earthwork guidelines and specifications would be followed for the construction of small retention dams and reservoirs.

### Seeps-Springs

A cooperative agreement between BLM and permittee for construction and maintenance would be developed where applicable.

In order to protect known cultural values, threatened, endangered, and sensitive plant and animal species, a clearance would be required prior to development.

The sites would be restored to the original conformation of the site. Seeding of adapted species would be used to restore disturbed areas.

Some water would be left at the original source for wildlife purposes.

A wildlife escape device would be installed in all open water troughs capable of trapping wildlife.



## Appendix 8 (Continued)

Water troughs and above-ground tanks and facilities would be designed and painted to blend with the natural environment. Water tanks would be anchored with wooden posts.

### Guzzlers

The shape and color of guzzlers would blend with the natural environment.

A wildlife escape ramp would be installed in conjunction with all open water troughs capable of trapping wildlife.

Fencing to restrict livestock and wildlife from the collection and storage areas would comply with BLM fence stipulations.

### Fencing

All fences would be built according to BLM specification.

Clearing of fence lines prior to construction would be limited to brush removal.

Gates would be installed along the fence at intersections of all official access roads or trails; in natural passes, and other strategic places to facilitate planned movement of livestock.

A cooperative agreement between BLM and permittee for construction and maintenance of fences would be developed where applicable.

A clearance for cultural values, and threatened, endangered, and sensitive species would be required prior to construction.

### Water Pipelines

A cooperative agreement between BLM and permittee for construction and maintenance would be developed where applicable.

In order to protect known cultural values, threatened, endangered, and sensitive plant and animal species, a clearance would be required prior to construction.

The sites would be restored to the original conformation of the land. Seeding of adapted species would be used to restore disturbed areas.

A wildlife escape device would be installed in all watering troughs capable of trapping wildlife.

Water troughs and above-ground tanks and facilities would be designed and painted to blend with the natural environment. Water tanks would be anchored with wooden posts.



## UTILITY CORRIDOR SEGMENTS

REFER TO FIGURE 2 - 5

	BLM	BLM	BLM	BLM	BLM	BLM
State						
Private	P	S				
			P			

## WILDLIFE

Elk summer range
Elk winter range
Elk calving areas
Deer summer range
Deer winter range
Deer fawning areas
Sage Grouse leks
Grudal Antelope range

## WATERSHED

100 year floodplain			
Public water reserve			
Critical/severe erosion area	C/S	C/S	C/S

## RECREATION

Campgrounds	
VRM Class II	
VRM Class III	
River Corridor	RC
Overlook	

## WOODLANDS

Productive areas

## THREATENED AND ENDANGERED SPECIES

Flora	0	5	10	15
F				

18 miles

15

10

5

**WEST TO EAST**



REFER TO FIGURE 2 - 5

LAND OWNERSHIP	BLM	BLM	BLM
State	S		S
Private			

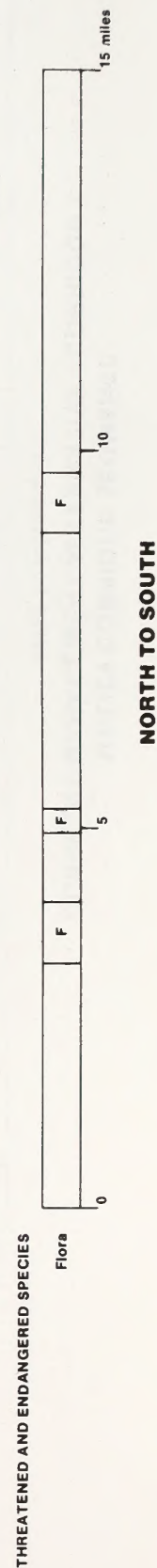
WILDLIFE	
Elk summer range	
Elk winter range	
Elk calving areas	
Deer summer range	
Deer winter range	
Deer lawning areas	
Sage Grouse leks	
Crucial Antelope range	A

<b>WATERSHED</b>
100 year floodplain
Public water reserve
Critical/severe erosion area

<b>RECREATION</b>
Campgrounds
VRM Class II
VRM Class III
River Corridor
Overlook

WOODLANDS

Productive areas





REFER TO FIGURE 2 - 5

	BLM		BLM		BLM
		S		S	
P					

Elk summer range					
Elk winter range					
Elk calving areas					
Deer summer range					
Deer winter range					
Deer lawning areas					
Sage Grouse lake					
Crucial Antelope range					

100 year floodplain					
Public water reserve					
Critical/severe erosion area	C/S			C/S	C/S

Campgrounds
VRM Class II
VRM Class III
River Corridor
Overlook

Productive areas

Plant Group	Number of Species
Dicotyledons	18
Monocotyledons	12
Gymnosperms	8
Angiosperms	15
Ferns	2

## NORTH TO SOUTH



# UTILITY CORRIDOR SEGMENTS CURRENT MANAGEMENT ALTERNATIVE - CORRIDOR 4

REFER TO FIGURE 2 - 5

## LAND OWNERSHIP

BLM	BLM	BLM	BLM	BLM
	S		S	
				P

## WILDLIFE

Elk summer range	
Elk winter range	
Elk calving areas	
Deer summer range	
Deer winter range	
Deer lawning areas	
Sage Grouse leks	
Crucial Antelope range	A

## WATERSHED

100 year floodplain	
Public water reserve	
Critical/severe erosion area	

## RECREATION

Campgrounds	
VRM Class II	
VRM Class III	
River Corridor	
Overlook	

## WOODLANDS

Productive areas	
------------------	--

## THREATENED AND ENDANGERED SPECIES

Flora	
-------	--

14 miles

10

5

0

WEST TO EAST



# UTILITY CORRIDOR SEGMENTS CURRENT MANAGEMENT ALTERNATIVE - CORRIDOR 5

REFER TO FIGURE 2 - 5

## LAND OWNERSHIP

BLM	BLM	BLM	BLM
State			
Private	P		P

## WILDLIFE

Elk summer range			
Elk winter range			
Elk calving areas			
Deer summer range		D	
Deer winter range			
Deer fawning areas			
Sage Grouse leks			
Crucial Antelope range	A	A	

## WATERSHED

100 year floodplain	FL	
Public water reserve		
Critical/severe erosion area		

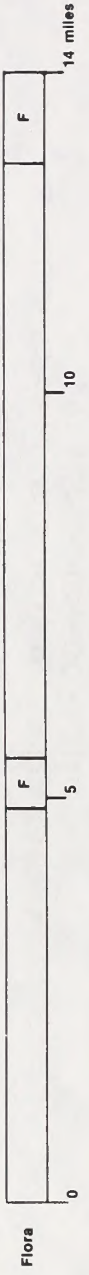
## RECREATION

Campgrounds		
VRM Class II	V	
VRM Class III		
River Corridor		
Overlook		

## WOODLANDS

Productive areas	
------------------	--

## THREATENED AND ENDANGERED SPECIES



NORTH TO SOUTH







**REFER TO FIGURE 2 - 5**

[illegible]

Elk summer range
Elk winter range
Elk calving areas
Deer summer range
Deer winter range
Deer lawning areas
Sage Grouse leks
Crucial Antelope range

100 year floodplain	FL	FL
Public water reserve		
Critical/severe erosion area	C/S	

Campgrounds
VRM Class II
VRM Class III
River Corridor
Overlook

Productive areas

The chart shows the distribution of plant species (Flora) across a distance of 0 to 12 miles, categorized by West to East. The chart is divided into segments labeled 'F' (Flora) and '0' (no Flora).

Distance (miles)	Flora Distribution
0 - 2	0
2 - 4	F
4 - 6	0
6 - 8	F
8 - 10	0
10 - 12	F



# UTILITY CORRIDOR SEGMENTS CURRENT MANAGEMENT ALTERNATIVE - CORRIDOR 8

REFER TO FIGURE 2 - 5

## LAND OWNERSHIP

BLM	BLM	BLM	BLM	BLM
State	S			
Private	P		P	

## WILDLIFE

Elk summer range				
Elk winter range			E	
Elk calving areas				
Deer summer range				
Deer winter range			D	
Deer lawning areas				
Sage Grouse leks				
Crucial Antelope range				

## WATERSHED

100 year floodplain	FL	FL		
Public water reserve				
Critical/severe erosion area		C/S		

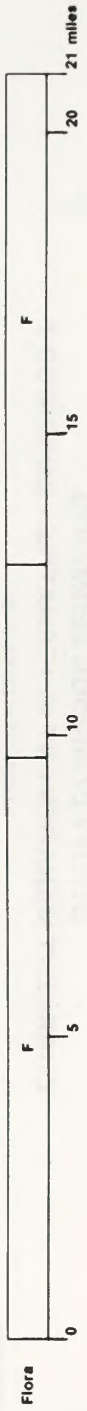
## RECREATION

Campgrounds				
VRM Class II				
VRM Class III				
River Corridor				
Overlook				

## WOODLANDS

Productive areas		P		
------------------	--	---	--	--

## THREATENED AND ENDANGERED SPECIES



NORTH TO SOUTH



REFER TO FIGURE 2 - 5

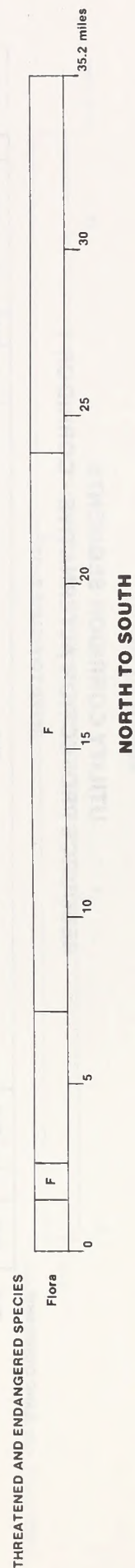
[illegible]

WILDLIFE			
Elk summer range			E
Elk winter range		E	
Elk calving areas			
Deer summer range			D
Deer winter range		D	
Deer lawning areas			
Sage Grouse leks			S
Crucial Antelope range			

WATERSHED	
100 year floodplain	
Public water reserve	
Critical/severe erosion area	C/S

RECREATION
Campgrounds
VRM Class II
VRM Class III
River Corridor
Overlook

WOODLANDS				
Productive areas				
	P	P	P	P





# UTILITY CORRIDOR SEGMENTS RESOURCE PROTECTION ALTERNATIVE - CORRIDOR 1

REFER TO FIGURE 2 - 11

## LAND OWNERSHIP

BLM	BLM	BLM	BLM	BLM	BLM	BLM
S	S	S	S	S	S	S
P	P	P	P	P	P	P

## WILDLIFE

Elk summer range						
Elk winter range						
Elk calving areas						
Deer summer range						
Deer winter range						
Deer lawning areas						
Sage Grouse leks						
Crucial Antelope range						

## WATERSHED

100 year floodplain						
Public water reserve						
Critical/severe erosion area						

## RECREATION

Campgrounds						
VRM Class II						
VRM Class III						
River Corridor						
Overlook						

## WOODLANDS

Productive areas						
------------------	--	--	--	--	--	--

## THREATENED AND ENDANGERED SPECIES

Flora						
-------	--	--	--	--	--	--

NORTH TO SOUTH

0 5 10 15 20 25 30 35 37 miles



# UTILITY CORRIDOR SEGMENTS RESOURCE PROTECTION ALTERNATIVE - CORRIDOR 2

REFER TO FIGURE 2 - 11

## LAND OWNERSHIP

BLM	BLM	BLM	BLM	BLM
State			S	
Private	P	P		P

## WILDLIFE

Elk summer range	
Elk winter range	
Elk calving areas	
Deer summer range	
Deer winter range	D
Deer fawning areas	
Sage Grouse leks	
Crucial Antelope range	

## WATERSHED

100 year floodplain	FL
Public water reserve	
Critical/severe erosion area	

## RECREATION

Campgrounds	
VRM Class II	
VRM Class III	V
River Corridor	
Overlook	

## WOODLANDS

Productive areas	
------------------	--

## THREATENED AND ENDANGERED SPECIES

Flora	F
-------	---

16.5 miles

15

10

5

0

NORTH TO SOUTH







# UTILITY CORRIDOR SEGMENTS RESOURCE PROTECTION ALTERNATIVE - CORRIDOR 4

REFER TO FIGURE 2 - 11

## LAND OWNERSHIP

BLM	BLM	BLM	BLM
State	S		
Private		P	

## WILDLIFE

Elk summer range			
Elk winter range			
Elk calving areas			
Deer summer range			
Deer winter range			
Deer tawning areas			
Sage Grouse leks			
Crucial Antelope range	A	A	

## WATERSHED

100 year floodplain			
Public water reserve			
Critical/severe erosion area	C/S		

## RECREATION

Campgrounds			
VRM Class II			
VRM Class III			
River Corridor			
Overlook			

## WOODLANDS

Productive areas			
------------------	--	--	--

## THREATENED AND ENDANGERED SPECIES

Flora			F
-------	--	--	---

19 miles

NORTH TO SOUTH



# UTILITY CORRIDOR SEGMENTS RESOURCE PROTECTION ALTERNATIVE - CORRIDOR 5

REFER TO FIGURE 2 - 11

## LAND OWNERSHIP

BLM	BLM	BLM	BLM	BLM	BLM	BLM
S	S	S	S	S	S	S
State	State	State	State	State	State	State
Private	Private	Private	Private	Private	Private	Private

## WILDLIFE

Elk summer range						
Elk winter range						
Elk calving areas						
Deer summer range						
Deer winter range						
Deer tawling areas						
Sage Grouse leks						
Crucial Antelope range						A

## WATERSHED

100 year floodplain		FL				
Public water reserve						
Critical/severe erosion area		C/S				

## RECREATION

Campgrounds						
VRM Class II		V				
VRM Class III						
River Corridor						
Overlook						

## WOODLANDS

Productive areas						
------------------	--	--	--	--	--	--

## THREATENED AND ENDANGERED SPECIES

Flora			F			
-------	--	--	---	--	--	--

17 miles

15

10

5

0

WEST TO EAST



# UTILITY CORRIDOR SEGMENTS RESOURCE PROTECTION ALTERNATIVE - CORRIDOR 6

REFER TO FIGURE 2 - 11

## LAND OWNERSHIP

BLM	BLM	BLM
State	S	
Private		

## WILDLIFE

Elk summer range	
Elk winter range	
Elk calving areas	
Deer summer range	
Deer winter range	
Deer fawning areas	
Sage Grouse leks	
Crucial Antelope range	A

## WATERSHED

100 year floodplain	
Public water reserve	
Critical/severe erosion area	

## RECREATION

Campgrounds	
VRM Class II	
VRM Class III	
River Corridor	
Overlook	

## WOODLANDS

Productive areas	
------------------	--

## THREATENED AND ENDANGERED SPECIES

Flora	
-------	--

5.8 miles

WEST TO EAST



# UTILITY CORRIDOR SEGMENTS RESOURCE PROTECTION ALTERNATIVE - CORRIDOR 7

REFER TO FIGURE 2 - 11

## LAND OWNERSHIP

BLM	BLM	BLM
State	S	
Private	P	

## WILDLIFE

Elk summer range	
Elk winter range	
Elk calving areas	
Deer summer range	D
Deer winter range	D
Deer fawning areas	
Sage Grouse leks	
Crucial Antelope range	A

## WATERSHED

100 year floodplain	
Public water reserve	
Critical/severe erosion area	

## RECREATION

Campgrounds	
VRM Class II	
VRM Class III	
River Corridor	
Overlook	

## WOODLANDS

Productive areas	
------------------	--

## THREATENED AND ENDANGERED SPECIES

Flora	F	F	F
-------	---	---	---

10.8 miles

10

5

0

NORTH TO SOUTH



REFER TO FIGURE 2 - 11

	BLM		BLM		BLM		BLM		BLM	
						S				
P	P	P	P	P	P					

Elk summer range
Elk winter range
Elk calving areas
D
Deer summer range
D
Deer winter range
Deer fawning areas
Sage Grouse leks
Crucial Antelope range

100 year floodplain	FL			
Public water reserve				
Critical/severe erosion area		— C/S	C/S	C/S

Campgrounds	
VRM Class II	V
VRM Class III	V
River Corridor	
Overlook	

Productive areas

Flora	0	5	10	15	20
		F		F	F

**22.5 miles**

20

15

10

5

1

## WEST TO EAST



**UTILITY CORRIDOR SEGMENTS**  
**COMMODITY PRODUCTION ALTERNATIVE - CORRIDOR 1**

REFER TO FIGURE 2 - 19

## LAND OWNERSHIP

[illegible]

## WILDLIFE

Elk summer range		E
Elk winter range		
Elk calving areas		
Deer summer range		D
Deer winter range		
Deer lawning areas		
Sage Grouse leks		
Crucial Antelope range		

## WATERSHED

100 year floodplain
Public water reserve
Critical/severe erosion area

## RECREATION

Campgrounds	C
VRM Class II	
VRM Class III	
River Corridor	
Overlook	

## WOODLANDS

Productive areas	p	p	p	p
------------------	---	---	---	---

## THREATENED AND ENDANGERED SPECIES

A vertical scale with tick marks at 0, 5, 10, 15, and 20. A small box containing the letter 'F' is positioned at the 0 mark.

## NORTH TO SOUTH



REFER TO FIGURE 2 - 19

[illegible]

Elk summer range				E
Elk winter range			E	
Elk calving areas				
Deer summer range		D		D
Deer winter range		D		
Deer lawning areas				
Sage Grouse leks				S
Crucial Antelope range				

100 year floodplain				
Public water reserve				
Critical/severe erosion area	C/S		C/S	C/S

[illegible][illegible]

## NORTH TO SOUTH



# UTILITY CORRIDOR SEGMENTS COMMODITY PRODUCTION ALTERNATIVE - CORRIDOR 3

REFER TO FIGURE 2 - 19

## LAND OWNERSHIP

BLM	BLM	BLM	BLM	BLM	BLM
State		S		S	
Private	P				

## WILDLIFE

Elk summer range	E			E
Elk winter range				
Elk calving areas				
Deer summer range				D
Deer winter range	D			
Deer lawning areas				
Sage Grouse leks				S
Crucial Antelope range				

## WATERSHED

100 year floodplain	FL	
Public water reserve		
Critical/severe erosion area		

## RECREATION

Campgrounds	
VRM Class II	
VRM Class III	
River Corridor	
Overlook	

## WOODLANDS

Productive areas	P
------------------	---

## THREATENED AND ENDANGERED SPECIES

Flora	F	S	10	15	18.4 miles
-------	---	---	----	----	------------

NORTH TO SOUTH



# UTILITY CORRIDOR SEGMENTS COMMODITY PRODUCTION ALTERNATIVE - CORRIDOR 4

REFER TO FIGURE 2 - 19

## LAND OWNERSHIP

BLM			BLM		BLM
State				S	
Private	P				P

## WILDLIFE

Elk summer range					E
Elk winter range	E		E		
Elk calving areas					
Deer summer range					D
Deer winter range	D		D		
Deer lawning areas					
Sage Grouse lek					
Crucial Antelope range					

## WATERSHED

100 year floodplain					
Public water reserve					
Critical/severe erosion area	C/S		C/S		C/S

## RECREATION

Campgrounds					
VRM Class II					V
VRM Class III					
River Corridor					
Overlook					

## WOODLANDS

Productive areas	P		P		
------------------	---	--	---	--	--

## THREATENED AND ENDANGERED SPECIES

Flora	F		F		
-------	---	--	---	--	--

20 miles

15

10

5

0

NORTH TO SOUTH



**REFER TO FIGURE 2 - 19**

[illegible]

WILDLIFE	
Elk summer range	
Elk winter range	
Elk calving areas	
Deer summer range	
Deer winter range	
Deer lawning areas	
Sage Grouse leks	
Crucial Antelope range	

100 year floodplain		
Public water reserve		
Critical/severe erosion area		C/S

Campgrounds		C		C
VRM Class II				
VRM Class III				
River Corridor				
Overlook				

Productive areas							
		P		P			P

Flora	Percentage of Species
0	16
2	14
4	12
6	10
8	8
10	6
12	4
14	2
16	0



# UTILITY CORRIDOR SEGMENTS COMMODITY PRODUCTION ALTERNATIVE - CORRIDOR 6

REFER TO FIGURE 2 - 19

## LAND OWNERSHIP

BLM	BLM	
State		
Private	P	

## WILDLIFE

Elk summer range		
Elk winter range	E	
Elk calving areas		
Deer summer range		
Deer winter range	D	D
Deer lawning areas		
Sage Grouse leks		
Crucial Antelope range		

## WATERSHED

100 year floodplain	FL	
Public water reserve		
Critical/severe erosion area		

## RECREATION

Campgrounds		
VRM Class II		
VRM Class III		
River Corridor		
Overlook		

## WOODLANDS

Productive areas	P	
------------------	---	--

## THREATENED AND ENDANGERED SPECIES

Flora		
-------	--	--

8 miles

7

6

5

4

3

2

1

0

WEST TO EAST



# UTILITY CORRIDOR SEGMENTS COMMODITY PRODUCTION ALTERNATIVE - CORRIDOR 7

REFER TO FIGURE 2 - 19

## LAND OWNERSHIP

BLM	BLM	BLM	BLM	BLM	BLM
S	S	S	S	S	S
P	P	P	P	P	P

## WILDLIFE

Elk summer range					
Elk winter range					E
Elk calving areas					
Deer summer range	D				
Deer winter range	D				D
Deer fawning areas					
Sage Grouse leks					
Crucial Antelope range					

## WATERSHED

100 year floodplain	FL				
Public water reserve					
Critical/severe erosion area		C/S			

## RECREATION

Campgrounds					
VRM Class II	V				
VRM Class III		V			
River Corridor					
Overlook					

## WOODLANDS

Productive areas			P	P	P
------------------	--	--	---	---	---

## THREATENED AND ENDANGERED SPECIES

Flora	F	F	F	F	F
-------	---	---	---	---	---

25 miles

15

10

5

NORTH TO SOUTH



# UTILITY CORRIDOR SEGMENTS COMMODITY PRODUCTION ALTERNATIVE - CORRIDOR 8

REFER TO FIGURE 2 - 19

## LAND OWNERSHIP

BLM	BLM	BLM	BLM	BLM	BLM	BLM
S	S				S	
P		P		P		P

## WILDLIFE

Elk summer range	
Elk winter range	
Elk calving areas	
Deer summer range	D
Deer winter range	D
Deer tawning areas	
Sage Grouse leks	
Crucial Antelope range	

## WATERSHED

100 year floodplain	FL
Public water reserve	
Critical/severe erosion area	

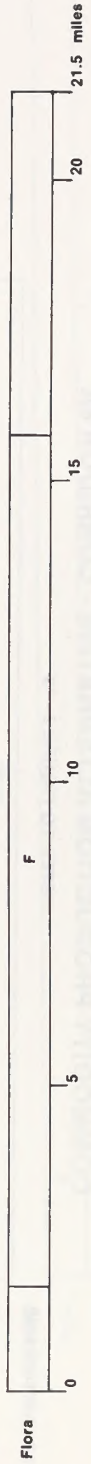
## RECREATION

Campgrounds	C	C
VRM Class II		
VRM Class III	V	V
River Corridor		
Overlook		

## WOODLANDS

Productive areas	
------------------	--

## THREATENED AND ENDANGERED SPECIES



NORTH TO SOUTH



# UTILITY CORRIDOR SEGMENTS COMMODITY PRODUCTION ALTERNATIVE - CORRIDOR 8A

REFER TO FIGURE 2 - 19

## LAND OWNERSHIP

BLM	BLM
State	
Private	

## WILDLIFE

Elk summer range	
Elk winter range	
Elk calving areas	
Deer summer range	D
Deer winter range	D
Deer lawning areas	
Sage Grouse leks	
Crucial Antelope range	

## WATERSHED

100 year floodplain	FL
Public water reserve	
Critical/severe erosion area	C/S

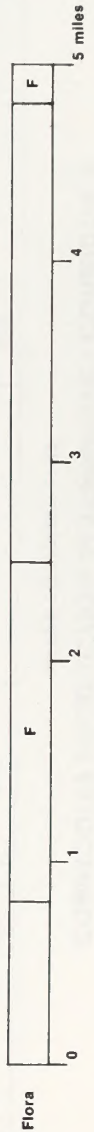
## RECREATION

Campgrounds	
VRM Class II	
VRM Class III	
River Corridor	
Overlook	

## WOODLANDS

Productive areas	
------------------	--

## THREATENED AND ENDANGERED SPECIES



WEST TO EAST



# UTILITY CORRIDOR SEGMENTS COMMODITY PRODUCTION ALTERNATIVE - CORRIDOR 9

REFER TO FIGURE 2 - 19

## LAND OWNERSHIP

BLM	BLM	BLM
State	S	
Private		

## WILDLIFE

Elk summer range
Elk winter range
Elk calving areas
Deer summer range
Deer winter range
Deer fawning areas
Sage Grouse leks
Crucial Antelope range

## WATERSHED

100 year floodplain
Public water reserve
Critical/severe erosion area
C/S

## RECREATION

Campgrounds
VRM Class II
VRM Class III
River Corridor
Overlook

## WOODLANDS

Productive areas
------------------

## THREATENED AND ENDANGERED SPECIES

Flora
F

11 miles

10

8

6

4

2

0

NORTH TO SOUTH



# UTILITY CORRIDOR SEGMENTS COMMODITY PRODUCTION ALTERNATIVE - CORRIDOR 10

REFER TO FIGURE 2 - 19

## LAND OWNERSHIP

BLM	BLM	BLM
S	S	
Private		

## WILDLIFE

Elk summer range			
Elk winter range			
Elk calving areas			
Deer summer range	D	D	
Deer winter range	D	D	
Deer lawning areas			
Sage Grouse leks			
Crucial Antelope range	A		

## WATERSHED

100 year floodplain	FL	FL
Public water reserve		
Critical/severe erosion area	C/S	C/S

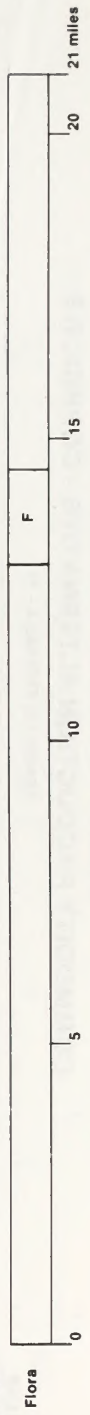
## RECREATION

Campgrounds		
VRM Class II	V	
VRM Class III		
River Corridor		
Overlook		

## WOODLANDS

Productive areas	
------------------	--

## THREATENED AND ENDANGERED SPECIES



WEST TO EAST



# UTILITY CORRIDOR SEGMENTS COMMODITY PRODUCTION ALTERNATIVE - CORRIDOR 11

REFER TO FIGURE 2 - 19

## LAND OWNERSHIP

BLM	BLM
State	S
Private	

## WILDLIFE

Elk summer range
Elk winter range
Elk calving areas
Deer summer range
Deer winter range
Deer fawning areas
Sage Grouse leks
Crucial Antelope range

## WATERSHED

100 year floodplain
Public water reserve
Critical/severe erosion area

## RECREATION

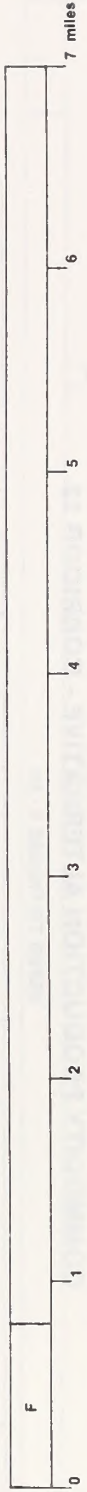
Campgrounds
VRM Class II
VRM Class III
River Corridor
Overlook

## WOODLANDS

## Productive areas

## THREATENED AND ENDANGERED SPECIES

## Flora





# UTILITY CORRIDOR SEGMENTS COMMODITY PRODUCTION ALTERNATIVE - CORRIDOR 12

REFER TO FIGURE 2 - 19

## LAND OWNERSHIP

BLM	BLM	BLM	BLM	BLM
S	S	S	S	S
Private				

## WILDLIFE

Elk summer range	
Elk winter range	
Elk calving areas	
Deer summer range	
Deer winter range	
Deer lawning areas	
Sage Grouse leks	
Crucial Antelope range	

## WATERSHED

100 year floodplain	FL
Public water reserve	
Critical/severe erosion area	C/S

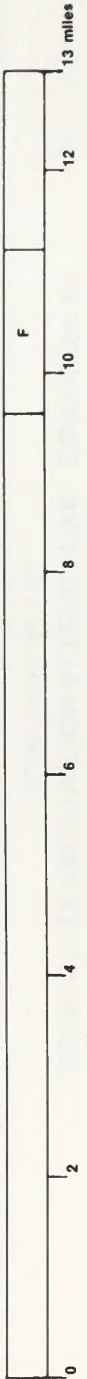
## RECREATION

Campgrounds	
VRM Class II	V
VRM Class III	
River Corridor	
Overlook	

## WOODLANDS

Productive areas	
------------------	--

## THREATENED AND ENDANGERED SPECIES



WEST TO EAST



## UTILITY CORRIDOR SEGMENTS

REFER TO FIGURE 2 - 19

LAND OWNERSHIP		REFER TO FIGURE 2 - 19				
BLM	BLM	BLM	BLM	BLM	BLM	
State	S	S	S	S	S	
Private					P	P

WILDLIFE			A	A
Elk summer range				
Elk winter range				
Elk calving areas				
Deer summer range				
Deer winter range				
Deer fawning areas				
Sage Grouse leks				
Crucial Antelope range				A

WATERSHED
100 year floodplain
Public water reserve
Critical/severe erosion area

Campgrounds			
VRM Class II			
VRM Class III		V	
River Corridor			
Overlook			

**WOODLANDS**

Category	Number of Species
F	15

## WEST TO EAST

20 miles



# UTILITY CORRIDOR SEGMENTS COMMODITY PRODUCTION ALTERNATIVE - CORRIDOR 14

REFER TO FIGURE 2 - 19

## LAND OWNERSHIP

BLM	BLM
State	
Private	

## WILDLIFE

Elk summer range	
Elk winter range	
Elk calving areas	
Deer summer range	
Deer winter range	
Deer fawning areas	
Sage Grouse leks	
Crucial Antelope range	A

## WATERSHED

100 year floodplain	
Public water reserve	
Critical/severe erosion area	

## RECREATION

Campgrounds	
VRM Class II	V
VRM Class III	
River Corridor	
Overlook	

## WOODLANDS

Productive areas	
------------------	--

## THREATENED AND ENDANGERED SPECIES

Flora	
-------	--

10 miles

WEST TO EAST



REFER TO FIGURE 2 - 19

BLM		BLM
		S

Elk summer range
Elk winter range
Elk calving areas
Deer summer range
Deer winter range
Deer lawning areas
Sage Grouse leks
Crucial Antelope range

100 year floodplain
Public water reserve
Critical/severe erosion area

Campgrounds
VRM Class II
VRM Class III
River Corridor
Overlook

**Productive areas**

## NORTH TO SOUTH



# UTILITY CORRIDOR SEGMENTS COMMODITY PRODUCTION ALTERNATIVE - CORRIDOR 16

REFER TO FIGURE 2 - 19

## LAND OWNERSHIP

BLM	BLM	BLM
State	S	
Private		

## WILDLIFE

Elk summer range
Elk winter range
Elk calving areas
Deer summer range
Deer winter range
Deer fawning areas
Sage Grouse leks
Crucial Antelope range

## WATERSHED

100 year floodplain
Public water reserve
C/S
Critical/severe erosion area

## RECREATION

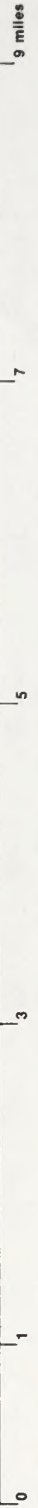
Campgrounds
VRM Class II
VRM Class III
River Corridor
Overlook

## WOODLANDS

Productive areas
------------------

## THREATENED AND ENDANGERED SPECIES

Flora
-------





# UTILITY CORRIDOR SEGMENTS COMMODITY PRODUCTION ALTERNATIVE - CORRIDOR 17

REFER TO FIGURE 2 - 19

## LAND OWNERSHIP

BLM	BLM	BLM
State		S
Private	P	

## WILDLIFE

Elk summer range
Elk winter range
Elk calving areas
Deer summer range
Deer winter range
Deer lawning areas
Sage Grouse leks
Crucial Antelope range

## WATERSHED

100 year floodplain
Public water reserve
Critical/severe erosion area

## RECREATION

Campgrounds
VRM Class II
VRM Class III
River Corridor
Overlook

## WOODLANDS

Productive areas
------------------

## THREATENED AND ENDANGERED SPECIES

Flora
-------

NORTH TO SOUTH

5 miles



REFER TO FIGURE 2 - 19

BLM		BLM		BLM
	S		S	S

Elk summer range		
Elk winter range		
Elk calving areas		
Deer summer range	D	
Deer winter range	D	
Deer lawning areas		
Sage Grouse leks		
Grucial Antelope range		A

100 year floodplain	FL			
Public water reserve				
Critical/severe erosion area		— C/S	C/S	

Campgrounds	
VRM Class II	
VRM Class III	
River Corridor	
Overlook	0

Productive areas

Flora

0 3 6 9 12 15 18 21 24 miles

F F F

WEST TO EAST



## UTILITY CORRIDOR SEGMENTS

REFER TO FIGURE 2 - 19

LAND OWNERSHIP	REFER TO FIGURE 2 - 19									
	BLM	BLM	BLM	BLM	BLM	BLM	BLM	BLM	BLM	BLM
State				S		S		S		S
Private	P		P				P			

WILDLIFE	
Elk summer range	
Elk winter range	
Elk calving areas	
Deer summer range	D
Deer winter range	D
Deer lawning areas	
Sage Grouse leks	
Crucial Antelope range	

WATERSHED				
	FL			
100 year floodplain				
Public water reserve				
Critical/severe erosion area		C/S	C/S	C/S

RECREATION	
Campgrounds	
VRM Class II	V
VRM Class III	V
River Corridor	RC
Overlook	

**WOODLANDS**  
Productive areas

A horizontal bar chart titled 'THREATENED AND ENDANGERED SPECIES' with a y-axis labeled 'Flora'. The x-axis represents the number of species, with tick marks at 0, 5, 10, and 15. There are four bars of different lengths, each labeled with a letter or number above it. The first bar (labeled 'F') extends to the 5 mark. The second bar (labeled '10') extends to the 10 mark. The third bar (labeled '15') extends to the 15 mark. The fourth bar (labeled '0') is very short, extending only slightly past the 0 mark.

Category	Value
F	5
10	10
15	15
0	0.5

## WEST TO EAST



REFER TO FIGURE 2 - 19

BLM	BLM	BLM
State		
Private	P	

WILDLIFE	
Elk summer range	
Elk winter range	E
Elk calving areas	
Deer summer range	
Deer winter range	D
Deer lawning areas	
Sage Grouse leks	
Crucial Antelope range	

WATERSHED			
100 year floodplain		FL	
Public water reserve			
Critical/severe erosion area	C/S	C/S	C/S

RECREATION
Campgrounds
VRM Class II
VRM Class III
River Corridor
Overlook

WOODLANDS	P	P	P
Productive areas			

Flora

0 1 2 3 4 5 6 F



## UTILITY CORRIDOR SEGMENTS

### COMMODITY PRODUCTION ALTERNATIVE - CORRIDOR 21

**REFER TO FIGURE 2 - 19**

BLM			BLM	
		S		S

## LAND OWNERSHIP

BLM

State

**Private**

## WILDLIFE

### Eik summer range

### Eik winter range

### Eik caiving areas

### Deer summer range

### Deer winter range

### Deer fawning areas

## Sage Grouse Ieks

### Crucial Antelope range

## WATERSHED

100 year floodplain

Public water reserve

Critical/severe erosion area

## RECREATION

## Campgrounds

VRM Class II

### VRM Class III

## River Corridor

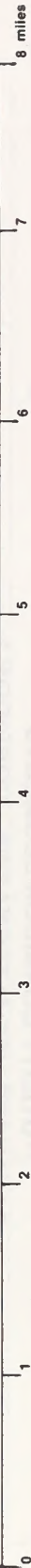
## Overlook

## WOODLANDS

### Productive areas

## THREATENED AND ENDANGERED SPECIES

## Flora



## NORTH TO SOUTH



# UTILITY CORRIDOR SEGMENTS BALANCED USE ALTERNATIVE - CORRIDOR 1

REFER TO FIGURE 2 - 26

## LAND OWNERSHIP

BLM	BLM	BLM	BLM	BLM	BLM	BLM
S			S		S	
		P				

## WILDLIFE

Elk summer range						E
Elk winter range						
Elk calving areas						
Deer summer range						D
Deer winter range						
Deer fawning areas						
Sage Grouse leks						
Crucial Antelope range						

## WATERSHED

100 year floodplain			FL			
Public water reserve						
Critical/severe erosion area		C/S			C/S	

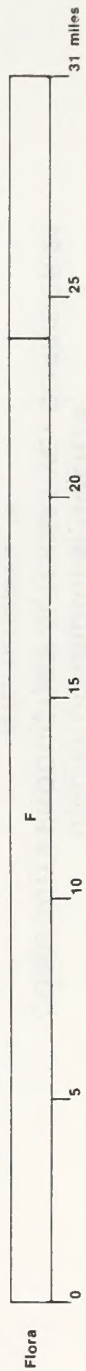
## RECREATION

Campgrounds		C				
VRM Class II						
VRM Class III						
River Corridor						
Overlook						

## WOODLANDS

Productive areas	P	P	P	P	P	P
------------------	---	---	---	---	---	---

## THREATENED AND ENDANGERED SPECIES



NORTH TO SOUTH



## UTILITY CORRIDOR SEGMENTS

REFER TO FIGURE 2 - 26

BLM	BLM	BLM	BLM
State	S	S	S
Private		P	P

## WILDLIFE

Elk summer range			E
Elk winter range			
Elk calving areas			E
Deer summer range			
Deer winter range			D
Deer lawning areas			
Sage Grouse leks			
Crucial Antelope range			

## WATERSHED

100 year floodplain			
Public water reserve			
Critical/severe erosion area	C/S		C/S

## RECREATION

Campgrounds				
VRM Class II				
VRM Class III				
River Corridor				
Overlook				

## WOODLANDS

Productive areas		p		p		p	

## THREATENED AND ENDANGERED SPECIES

Flora		F			F	
	0		10		20	30

## NORTH TO SOUTH



# UTILITY CORRIDOR SEGMENTS BALANCED USE ALTERNATIVE - CORRIDOR 3

REFER TO FIGURE 2 - 26

## LAND OWNERSHIP

BLM	BLM	BLM
State	S	S
Private		

## WILDLIFE

Elk summer range			
Elk winter range			
Elk calving areas			
Deer summer range	D		
Deer winter range	D		
Deer fawning areas			
Sage Grouse leks			
Crucial Antelope range	A		

## WATERSHED

100 year floodplain		FL	FL
Public water reserve			
Critical/severe erosion area	C/S	C/S	C/S

## RECREATION

Campgrounds			
VRM Class II		V	
VRM Class III			
River Corridor			
Overlook			

## WOODLANDS

Productive areas	
------------------	--

## THREATENED AND ENDANGERED SPECIES

Flora		F	
-------	--	---	--

21.6 miles

WEST TO EAST



# UTILITY CORRIDOR SEGMENTS BALANCED USE ALTERNATIVE - CORRIDOR 4

REFER TO FIGURE 2 - 26

## LAND OWNERSHIP

BLM	BLM
State	S
Private	

## WILDLIFE

Elk summer range	
Elk winter range	
Elk calving areas	
Deer summer range	D
Deer winter range	D
Deer lawning areas	
Sage Grouse leks	
Crucial Antelope range	

## WATERSHED

100 year floodplain	
Public water reserve	
Critical/severe erosion area	C/S

## RECREATION

Campgrounds	
VRM Class II	
VRM Class III	
River Corridor	RC
Overlook	

## WOODLANDS

Productive areas	
------------------	--

## THREATENED AND ENDANGERED SPECIES

Flora	F
-------	---

6.8 miles

WEST TO EAST



# UTILITY CORRIDOR SEGMENTS BALANCED USE ALTERNATIVE - CORRIDOR 5

REFER TO FIGURE 2 - 26

## LAND OWNERSHIP

BLM	BLM	BLM	BLM	BLM	BLM	BLM
State	S	S	S	S	S	S
Private				P	P	P

## WILDLIFE

Elk summer range	
Elk winter range	
Elk calving areas	
Deer summer range	
Deer winter range	
Deer fawning areas	
Sage Grouse leks	
Crucial Antelope range	A

## WATERSHED

100 year floodplain	
Public water reserve	
Critical/severe erosion area	C/S

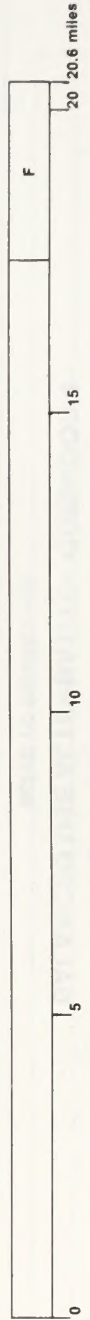
## RECREATION

Campgrounds	
VRM Class II	
VRM Class III	
River Corridor	
Overlook	

## WOODLANDS

Productive areas	
------------------	--

## THREATENED AND ENDANGERED SPECIES



NORTH TO SOUTH



# UTILITY CORRIDOR SEGMENTS BALANCED USE ALTERNATIVE - CORRIDOR 6

REFER TO FIGURE 2 - 26

## LAND OWNERSHIP

BLM	BLM	BLM	BLM	BLM
S	S	P	P	P

## WILDLIFE

Elk summer range				
Elk winter range				
Elk calving areas				
Deer summer range	D		D	
Deer winter range	D		D	
Deer fawning areas				
Sage Grouse leks				
Crucial Antelope range				

## WATERSHED

100 year floodplain	FL		FL	
Public water reserve				
Critical/severe erosion area		C/S		

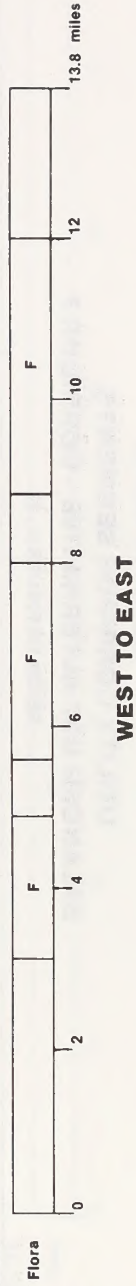
## RECREATION

Campgrounds				
VRM Class II	V		V	
VRM Class III		V		
River Corridor				
Overlook				

## WOODLANDS

Productive areas				
------------------	--	--	--	--

## THREATENED AND ENDANGERED SPECIES





# UTILITY CORRIDOR SEGMENTS BALANCED USE ALTERNATIVE - CORRIDOR 7

REFER TO FIGURE 2 - 26

## LAND OWNERSHIP

BLM	BLM	BLM
State	S	
Private		

## WILDLIFE

Elk summer range		
Elk winter range		
Elk calving areas		
Deer summer range	D	
Deer winter range	D	
Deer tawning areas		
Sage Grouse leks		
Crucial Antelope range		

## WATERSHED

100 year floodplain	FL	
Public water reserve		
Critical/severe erosion area		C/S

## RECREATION

Campgrounds		
VRM Class II	V	
VRM Class III		
River Corridor		
Overlook		

## WOODLANDS

Productive areas		
------------------	--	--

## THREATENED AND ENDANGERED SPECIES

Flora		
-------	--	--

3.8 miles

NORTH TO SOUTH



# UTILITY CORRIDOR SEGMENTS BALANCED USE ALTERNATIVE - CORRIDOR 8

REFER TO FIGURE 2 - 26

## LAND OWNERSHIP

BLM	BLM	BLM	BLM	BLM	BLM
State	State	State	State	State	State
Private	Private	Private	Private	Private	Private

## WILDLIFE

Elk summer range	
Elk winter range	
Elk calving areas	
Deer summer range	
Deer winter range	D
Deer fawning areas	
Sage Grouse lek	
Crucial Antelope range	

## WATERSHED

100 year floodplain	FL
Public water reserve	
Critical/savare erosion area	

## RECREATION

Campgrounds	
VRM Class II	
VRM Class III	V
River Corridor	
Overlook	

## WOODLANDS

Productive areas	
------------------	--

## THREATENED AND ENDANGERED SPECIES

Flora	F
-------	---

16.5 miles

NORTH TO SOUTH



# UTILITY CORRIDOR SEGMENTS BALANCED USE ALTERNATIVE - CORRIDOR 9

REFER TO FIGURE 2 - 26

## LAND OWNERSHIP

BLM	BLM	BLM
State	S	
Private		

## WILDLIFE

Elk summer range
Elk winter range
Elk calving areas
Deer summer range
Deer winter range
Deer fawning areas
Sage Grouse leks
Crucial Antelope range

## WATERSHED

100 year floodplain
Public water reserve
Critical/severe erosion area

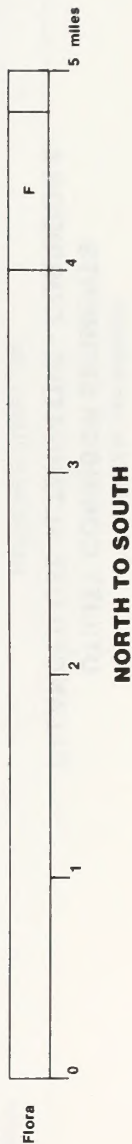
## RECREATION

Campgrounds
VRM Class II
VRM Class III
River Corridor
Overlook

## WOODLANDS

Productive areas
------------------

## THREATENED AND ENDANGERED SPECIES





# UTILITY CORRIDOR SEGMENTS BALANCED USE ALTERNATIVE - CORRIDOR 10

REFER TO FIGURE 2 - 26

## LAND OWNERSHIP

BLM	BLM	BLM	BLM	BLM	BLM	BLM
S	S	S	S	S	S	S

## WILDLIFE

Elk summer range						
Elk winter range						
Elk calving areas						
Deer summer range	D					
Deer winter range	D					
Deer lawning areas						
Sage Grouse leks						
Crucial Antelope range						A

## WATERSHED

100 year floodplain	FL					
Public water reserve						
Critical/severe erosion area	C/S					

## RECREATION

Campgrounds						
VRM Class II	V					
VRM Class III						
River Corridor						
Overlook						

## WOODLANDS

Productive areas						
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## THREATENED AND ENDANGERED SPECIES

Flora



WEST TO EAST



# UTILITY CORRIDOR SEGMENTS BALANCED USE ALTERNATIVE - CORRIDOR 11

REFER TO FIGURE 2 - 26

## LAND OWNERSHIP

BLM	BLM	BLM
State	S	
Private		

## WILDLIFE

Elk summer range
Elk winter range
Elk calving areas
Deer summer range
Deer winter range
Deer lawning areas
Sage Grouse leks
Crucial Antelope range
A

## WATERSHED

100 year floodplain
Public water reserve
Critical/severe erosion area

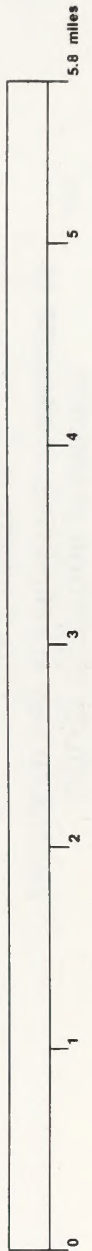
## RECREATION

Campgrounds
VRM Class II
VRM Class III
River Corridor
Overlook

## WOODLANDS

Productive areas
------------------

## THREATENED AND ENDANGERED SPECIES



WEST TO EAST



# UTILITY CORRIDOR SEGMENTS BALANCED USE ALTERNATIVE - CORRIDOR 12

REFER TO FIGURE 2 - 26

## LAND OWNERSHIP

BLM	BLM	BLM
S	S	
State		
Private		

## WILDLIFE

Elk summer range
Elk winter range
Elk calving areas
Deer summer range
Deer winter range
Deer lawning areas
Sage Grouse leks
Crucial Antelope range
A

## WATERSHED

100 year floodplain
Public water reserve
Critical/severe erosion area

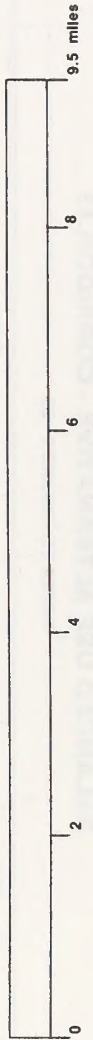
## RECREATION

Campgrounds
VRM Class II
VRM Class III
River Corridor
Overlook

## WOODLANDS

Productive areas
------------------

## THREATENED AND ENDANGERED SPECIES





# UTILITY CORRIDOR SEGMENTS BALANCED USE ALTERNATIVE - CORRIDOR 13

REFER TO FIGURE 2 - 26

## LAND OWNERSHIP

BLM	BLM	BLM
State	S	
Private	P	

## WILDLIFE

Elk summer range	
Elk winter range	
Elk calving areas	
Deer summer range	D
Deer winter range	D
Deer lawning areas	
Sage Grouse leks	
Crucial Antelope range	A

## WATERSHED

100 year floodplain	
Public water reserve	
Critical/severe erosion area	C/S

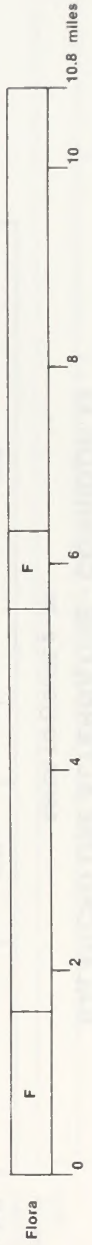
## RECREATION

Campgrounds	
VRM Class II	
VRM Class III	
River Corridor	
Overlook	

## WOODLANDS

Productive areas	
------------------	--

## THREATENED AND ENDANGERED SPECIES



NORTH TO SOUTH



# UTILITY CORRIDOR SEGMENTS BALANCED USE ALTERNATIVE - CORRIDOR 14

REFER TO FIGURE 2 - 26

## LAND OWNERSHIP

BLM	BLM
State	S
Private	

## WILDLIFE

Elk summer range	
Elk winter range	
Elk calving areas	
Deer summer range	D
Deer winter range	D
Deer lawning areas	
Sage Grouse leks	
Crucial Antelope range	A

## WATERSHED

100 year floodplain	
Public water reserve	
Critical/severe erosion area	C/S

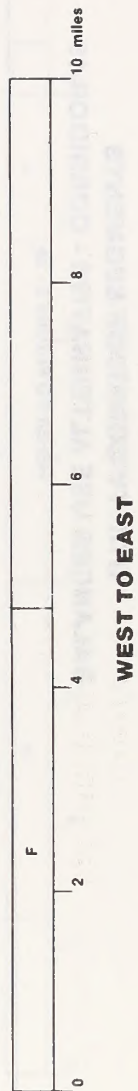
## RECREATION

Campgrounds	
VRM Class II	
VRM Class III	
River Corridor	RC
Overlook	

## WOODLANDS

Productive areas	
------------------	--

## THREATENED AND ENDANGERED SPECIES





# UTILITY CORRIDOR SEGMENTS BALANCED USE ALTERNATIVE - CORRIDOR 15

REFER TO FIGURE 2 - 26

## LAND OWNERSHIP

BLM	BLM	BLM
State	S	
Private		

## WILDLIFE

Elk summer range
Elk winter range
Elk calving areas
Deer summer range
Deer winter range
Deer fawning areas
Sage Grouse leks
Crucial Antelope range

## WATERSHED

100 year floodplain
Public water reserve
Critical/severe erosion area

## RECREATION

Campgrounds
VRM Class II
VRM Class III
River Corridor
Overlook

## WOODLANDS

Productive areas
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## THREATENED AND ENDANGERED SPECIES

Flora	F	0	0.5	1	1.5	1.8 miles
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WEST TO EAST



REFER TO FIGURE 2 - 26

[illegible]

## WILDLIFE

Elk summer range	
Elk winter range	
Elk calving areas	
Deer summer range	D
Deer winter range	D
Deer fawning areas	
Sage Grouse leks	
Crucial Antelope range	

## WATERSHED

100 year floodplain									
Public water reserve									
Critical/severe erosion area		C/S	C/S		C/S		C/S		C/S

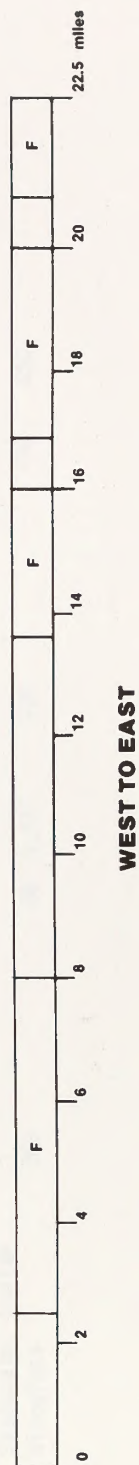
## RECREATION

Campgrounds	
VRM Class II	V
VRM Class III	V
River Corridor	RC
Overlook	

## WOODLANDS

Productive areas

## THREATENED AND ENDANGERED SPECIES









# APPENDIX 10

## ECOLOGICAL SITES AND CONDITIONS BY LOCALITY

- (1)Includes 2,875 altered acres by condition  
 (3)Includes 3 altered acres by condition  
 (5)Includes 11,552 altered acres by condition  
 (7)Includes 1,855 altered acres by condition  
 (9)Includes 257 altered acres by condition  
 (11)Includes 173 altered acres by condition  
 (2)Includes 719 altered acres by condition (Blue Mountain)  
 (4)Includes 1,030 altered acres by condition  
 (6)Includes 8,135 altered acres by condition  
 (8)Includes 15,886 altered acres by condition  
 (10)Includes 11 altered acres by condition  
 (12)Includes 186 acres altered by condition (Book Cliffs)

P = Poor F = Fair G = Good E = Excellent

Zone	Eco-site	Habitat	P	F	G	E	Blue Mountain Condition	P	F	G	E	Bonanza-Rainbow Condition	P	F	G	Hill Creek Condition	P	F	G	Book Cliffs Condition	E
Azonal	Badlands						1,778					75,682				23,554				2,346	
Azonal	Rock Outcrop						5,040					13,916				3,789				993	20,699
Azonal	Alkali Bottom	Greasewood, Alkali Sacatan																			
Azonal	Alkali Flat	Greasewood, Squir- reltail					108					57				429			14		
Azonal	Loamy Bottom(3)	Big Sagebrush, Basin Wild Rye					18					12,627				3,816			1,041	2,391	310
Azonal	Riverflood Plain	Bluegrass, Wheat- grass, Willow										254				903			63	33	1,407
Azonal	Wet Salt Streambank	Squawbush, Sand Bar Willow, Inland										768									24
Azonal	Wet Fresh Meadow	Saltgrass Willow, Sedge					63					310									
Desert	Alkali Bench	Shadscale, Wedgelaef Nuttal Saltbush																		15	17
Desert	Alkali Sand	Fourwing Saltbush, Indian Ricegrass										2,750				184					
Desert	Clay (Shadscale)	Shadscale, Bottle- brush Squirreltail					14					12,130				1,811			3,791		177
Desert	Loam	Shadscale, Indian Ricegrass					203					12,540									
												88				495			450		



Zone	Eco-site	Habitat	Blue Mountain Condition			Bonanza-Rainbow Condition			Hill Creek Condition			Book Cliffs Condition		
			P	F	G	E	P	F	G	E	P	F	G	E
Desert	Sand	Fourwing Saltbush, Indian Ricegrass						1,671	5,853			40		
Desert	Sandy Loam	Indian Ricegrass, Galleta Grass					693	12,161	5,657			157		
Desert	Shallow Clay	Mat Saltbush, Galleta Grass		115				6,239	8,320	6,110	26	2,344	3,536	
Desert	Shallow Loam (Black Sagebrush)	Black Sagebrush, Galleta Grass					25	5,119	9,612			2,525	4,245	1,595
Desert	Shallow Loam (Shadscale)	Shadscale, Galleta Grass		101			1,286	8,251	11,017			5,704	15,103	
Desert	Shaly Shallow Loam	Greasebush, Galleta Grass						2,090	2,117			2,514	4,352	1,570
Desert	Very Steep Shallow Loam (Shadscale)	Shadscale, Galleta Grass, Salina Wild Rye		21				6,023	2,150					
Semi-Desert	Gravelly Loam (Wyoming Big Sagebrush)	Wyoming Big Sagebrush, Galleta Grass, Indian Ricegrass		235	113			3,649	11,046			3,901	406	
Semi-Desert	Gravelly Sandy Loam	Wyoming Big Sagebrush, Indian Ricegrass			139			44,392	13,074	1,280	2,170	1,081	58	
Semi-Desert	Loam (Wyoming Big Sagebrush)	Wyoming Big Sagebrush, Indian Ricegrass		282	224			5,588	25,013	12,104		1,116	63	577
Semi-Desert	Sand	Fourwing Saltbush, Indian Ricegrass						1,089	1,900					
Semi-Desert	Sandy Loam	Fourwing Saltbush, Wyoming Big Sagebrush, Indian Ricegrass, Needle and Thread Grass		119	950			1,009	19,489	11,481	6,571			167
Semi-Desert	Shallow Loam (Wyoming Big Sagebrush)	Wyoming Big Sagebrush, Blue Bunch Wheatgrass, Indian Ricegrass			545			23,203	39,405	2,265		936	4,789	547



Zone	Eco-site	Habitat	Blue Mountain			Bonanza-Rainbow			Hill Creek			Book Cliffs				
			Condition			Condition			Condition			Condition				
			P	F	G	E	P	F	G	E	P	F	G	E		
Semi-Desert	Shallow Loam (Black Sagebrush)	Black Sagebrush,														
		Indian Ricegrass,														
		Bluegrama			234			18,887	8,088		3,856	22,547	1,678	99	98	
Semi-Desert	Shallow Loam (Utah Juniper-Pinyon)	Utah Juniper,														
		Pinyon Pine, Black Sagebrush, Salina														
Semi-Desert	Silt Loam	Wild Rye		2,613	2,659			15,608	65,911		501	2,082	102	174	2,070	
		Winterfat, Indian Ricegrass				58	1,575	2,589						3,343		
Semi-Desert	Stony Loam (Utah Juniper-Pinyon)	Utah Juniper,														
		Pinyon Pine, Saline Wild Rye						2,153	177							
Upland	Clay	Western Wheatgrass, Shadschal										1,345		11		
Upland	Loam (Big Sagebrush)(4)	Basin Big Sagebrush, Indian Ricegrass		37	24			1,308	479							
Upland	Shallow Loam (Black Sagebrush)	Black Sagebrush, Needle and Thread Grass, Blue Bunch														
Upland	Shallow Loam (Pinyon-Utah Juniper)(5)	Wheatgrass			127			147	2,926		9			1,292	320	
		Pinyon Pine, Utah Juniper, Salina														
Upland	Silt Loam	Wild Rye				1,696	1,448	2,927	6,910	5,582	340	4,668	149	9,005	58,711	1,334
Upland	Stony Loam (Pinyon-Utah Juniper)(6)	Fourwing Saltbush, Winterfat, Western Wheatgrass														
		Pinyon Pine, Utah Juniper, Black Sagebrush, Western Wheatgrass												1,273	1,298	
Upland	Stony Loam (Wyoming Big Sagebrush-Antelope Bitterbrush)(7)	Pinyon Pine, Utah Juniper, Black Sagebrush, Western Wheatgrass			1,911			1,174	674							
		Wyoming Big Sagebrush, Antelope Bitterbrush, Needle and Thread Grass												266	23,243	15,073
								312			1,935	459		2,585	2,688	



Zone	Eco-site	Habitat	Blue Mountain Condition			Bonanza-Rainbow Condition			Hill Creek Condition			Book Cliffs Condition		
			P	F	G	E	P	F	G	E	P	F	G	E
Upland	Very Steep Shallow Loam (Pinyon-Utah Juniper)(8)	Pinyon Pine, Utah Juniper, Birchleaf Mountain Mahogany, Salina Wild Rye			46			1,549				9,114	16,092	
Mountain	Loam(1)	Mountain Big Sagebrush, Western Wheatgrass		1,453	10,761	547								
Mountain	Stony Loam(2)(12)	Antelope Bitterbrush, Mountain Big Sagebrush, Needle and Thread Grass		526	524	2,044	99					573	8,525	
Mountain	Very Steep Stony Loam (Browse)(9)	Birchleaf Mountain Mahogany, Utah Serviceberry		1,241	31							2,274	13,440	708
Mountain	Loamy Bottom	Mountain Big Sagebrush, Basin Wild Rye, Bluegrass						16				385	4,054	2,273
Mountain	Stony Loam (Browse)	Utah Serviceberry, Birchleaf Mountain Mahogany, Salina Wild Rye												
Mountain	Stony Loam (Douglas fir)(10)	Douglas Fir, Snowberry, Western Wheatgrass										3,114	13,572	1,922
Mountain	Very Steep Stony Loam (Douglas Fir)(11)	Douglas Fir, Utah Serviceberry, Salina Wild Rye						73	818			1,178	1,324	1,151
High Mtn	Loam (Douglas Fir)	Douglas Fir, Elk Sedge										11,727	12,307	19,014
High Mtn	Very Steep (Douglas Fir)	Douglas Fir, Snowberry											1,059	4
High Mtn	Loam (Aspen)-Pyro-Climax	Aspen, Snowberry Sedge		3	61								1,666	1,218
													2,666	1,617

LOCALITY SUBTOTALS 645 7,981 27,433 2,094 9,001 257,519 343,940 22,845 3,854 34,324 98,068 3,701 433 64,247 195,895 43,483



# ALLOTMENT STATISTICS

(a) The Allotment Management Plan allows an additional 70 AUMs to each permittee; that is not shown as active preference. It is shown as full preference.

(b) Contains 628 Colorado AUM's managed by the Vernal District.

\*Allotment Management Category      M = Maintain      I = Improve      C = Custodial



Appendix 11  
Allotment Statistics

Allotment Name Allotment Num.	Acres	Ecological Condition (Federal Acres)		Fair	Good	Poor	Badland Rock	Numbers and Class of Livestock and Wild Horses		Present Objective Numbers	Season of Use	Active Average Pref. Use		Permittee	Avg. Full Acres Per AUM's			
		Exc.	Condition					Class	Numbers			AUM's	(AUM's)					
BLUE MOUNTAIN LOCALITY																		
Blue Mountain AMP 5825	1167	0	700	0	935	132	100	0	Cattle Horses Cattle Horses	24 1 23 1	31 3 40 1	_____ _____ _____ _____	(a)142 6 (a)138 6	186 17 238 8	I _____ _____ _____ _____	E.L. Wilkens _____ _____ _____ _____	212 6 208 6	2.6
Cub Creek AMP 5823	872	355	0	0	546	0	0	326	Cattle	18	18	_____	55	54	C	Rasmussen	124	
Doc's Valley 5821	8555	610	2526	592	5986	1657	0	320	Sheep Cattle Horses Cattle	626 49 7 22	626 49 7 22	_____ _____ _____ _____	751 294 42 132	751 294 42 132	I _____ _____ _____ _____	Chew Chew Chew L. Wilkens	1187 294 42 138	8.2
Green River 5820	19178	871	1044	972	7525	4475	119	6087	Sheep Cattle Cattle Cattle	2292 79 50 25	2552 79 50 25	_____ _____ _____ _____	1021 237 100 50	917 237 100 50	M _____ _____ _____ _____	Chew Chew E.V. Wilkens L. Wilkens	1201 237 120 60	13.6
Point of Pines 5822	5005	762	754	530	2383	1581	426	85	Cattle Cattle	261 25	262 25	_____ _____	(b)1308 150	304 150	I _____ _____	L.G. Murray B. Murray	1308 150	3.4

(a) The Allotment Management Plan allows an additional 70 AUMs to each permittee; that is not shown as active preference. It is shown as full preference.  
(b) Contains 628 Colorado AUM's managed by the Vernal District.

\*Allotment Management Category M = Maintain I = Improve C = Custodial



Appendix 11 (Continued)  
Allotment Statistics

Ecological Condition										Numbers and Class of Livestock and Wild Horses		Active Average					
Acres		(Federal Acres)				Season of Use		Pref. Use		Permittee							
Allotment Name		Badland Rock				Present Objective		J F M A M J J A S O N D		Full Pref. AUM's		Avg. Acres Per AUM					
Allotment Num.	Fed.	State	Pvt.	Exc.	Good	Fair	Poor	Outcrop	Class	Numbers	Objective Numbers	A E A P A U U E C O E	N B R R Y N L G P T V C	AUM's	(AUM's) MIC*	Permittee	
Stuntz Valley 5824	3375	787	634	0	3239	136	0	0	Cattle	271	271	(c)1355			1355	I M. Snow	1355 2.5
Subtotals	38152	3385	5658	2094	20614	7981	645	6818	Lvstck W.Horses			5787 0	5835 0	6648 0			
BONANZA-RAINBOW LOCALITY																	
Antelope 5854 Draw	70581	7928	40	3970	19466	28818	0	18327	Sheep W.Horses	2904 35	5273 45	5800 420			3194	I Preece	7047 540 12.2
Asphalt Draw AMP 8817	38559	5184	1404	1980	21596	13267	0	1716	Sheep	2662	4343	4343 2662			4343	I H. Seely	5390 8.9
Badlands 5848	12970	2292	0	40	4471	3580	0	4879	Cattle	247	260	780 741			780	I L.G. Murray	780 16.6
Baerer Wash 5832	14887	1974	563	0	3558	8905	130	2294	Sheep Cattle	918 8	1035 8	1242 12			1101	I Chew Holmes	1506 16 11.9
Bohemian Bottoms 5840	9334	1130	600	0	3104	4213	88	1929	Cattle Cattle	75 8	75 8	605 12			605	M Pickups Holmes	961 16 15.1
Bonanza 5842	22928	3275	491	0	2144	14880	693	5211	Sheep	1952	1625	1952 1827			1827	I Jones	2723 11.7

(c) This allotment contains 570 Colorado AUM's managed by the Vernal District.



Appendix 11 (Continued)  
Allotment Statistics

Allotment Name	Ecological Condition				Acres				Numbers and Class of Livestock and Wild Horses				Season of Use				Active Average Pref. Use		Full Pref. AUM's	Avg. Acres Per AUM			
	Federal	State	Pvt.	Exc.	Good	Fair	Poor	Outcrop	Badland Rock	Present Numbers	Objective Numbers	A	E	P	U	U	E	C			O	E	AUM's
Brewer 8831	2846	0	3	0	1394	1154	0	298	Cattle	30	30	—	—	—	—	—	120	120	C	S & H Ranches	200	23.7	
Cockleburrr 5833	18527	2077	753	0	10607	3385	1639	2896	Sheep	1297	1380	—	—	—	—	—	1746	1167	I	Chew	1842	14.9	
Halfway Hill 5861	7715	1145	104	9	2633	3949	232	892	Sheep	465	465	—	—	—	—	—	558	558	I	R. Siddoway	773	13.8	
Hells Hole 8819	25930	1241	5861	209	12298	8177	0	5246	Sheep	1678	4460	—	—	—	—	—	(d)4014	(e)1511	M	Nick Theos	4488	6.5	
Jensen 5836	6248	640	2576	0	410	4516	612	710	Sheep	257	257	—	—	—	—	—	231	230	I	Chew	260	9.1	
									Cattle	4	4	—	—	—	—	—	4	4		Chew	4		
									Cattle	3	3	—	—	—	—	—	6	6		E.V. Wilkens	6		
									Cattle	125	127	—	—	—	—	—	380	374		Christiansen	429		
									Cattle	75	75	—	—	—	—	—	75	75		Dudley	75		
K Ranch 5849	4473	177	3640	2	3665	725	77	4	Cattle			(f)238							K Ranch	418	18.8		
Kane Hollow 5837	7416	308	1087	4708	997	1586	74	51	Sheep	101	179	—	—	—	—	—	161	112	I	Chew	204	17.3	
									Cattle	178	178	—	—	—	—	—	267	267		Christiansen	338		
Little Emma 5852	49467	7351	2603	249	25377	17124	24	6693	Sheep	3536	4545	—	—	—	—	—	4545	3536	M	J. Seely	6135	10.9	

(d) This includes 500 AUM's in Colorado managed by the Vernal District.

(e) Data includes only 1 year since the merger of the Rabbit Mountain-Wagon Hound and Hells Hole Allotments.

(f) Managed by Colorado



Ecological Condition	Numbers and Class of Livestock and Wild Horses	Season of Use	Active Average Pref. Use
Acres (Federal Acres)			
			AUM's (AUM's) MIC* Permittee

Allotment Name Allotment Num.	Fed.	State	Pvt.	Exc.	Good	Fair	Poor	Badland Rock	Class	Present Numbers	Objective Numbers	J F M A M J J A S O N D												Full AUM's	Acres Per AUM			
												A E A P A U U E C O E																
												N B R R Y N L G P T V C																
Miners Gulch 5838	4556	106	0	0	591	3314	0	651	Cattle	100	102	—	—	—	—	—	—	—	—	—	—	—	—	100	C	Vincent's L.G. Murray Snow	129	30.0
Olsen AMP 8816	103214	18430	13235	731	49799	38480	0	14204	Sheep	3040	8371	—	—	—	—	—	—	—	—	—	—	—	—	3344	M	Olsen	10633	11.2
Powder Wash 5857	22691	3504	666	0	9665	9580	2341	1105	Sheep	1586	1750	—	—	—	—	—	—	—	—	—	—	—	—	1905	I	J. Siddoway	2307	10.8
Raven Ridge 5851	8963	1232	751	0	685	5827	1400	1051	Sheep	1038	1112	—	—	—	—	—	—	—	—	—	—	—	—	1038	I	C&L Livestock	1438	8.1
Sandwash 8818	54302	19306	6	0	28947	20697	312	4346	Sheep	1548	5850	—	—	—	—	—	—	—	—	—	—	—	—	1858	M	Cook	8443	7.7
Seven Sisters AMP 5845	15760	2777	0	2317	7315	4521	0	1607	Sheep W.Horses	1021	1745	—	—	—	—	—	—	—	—	—	—	—	—	1123	M	Amaya	2033	8.2
Snake John 5860	9275	1262	142	0	712	7124	1377	62	Sheep	844	970	—	—	—	—	—	—	—	—	—	—	—	—	1013	I	R. Siddoway	1447	8.0
Spring Hollow 5862	4822	600	269	268	1372	2133	0	1049	Cattle	148	148	—	—	—	—	—	—	—	—	—	—	—	—	444	I	M. Snow	444	10.9
(h)Stateline 5863	29740	3067	8934	1521	4300	21287	0	2632	Sheep	1245	2516	—	—	—	—	—	—	—	—	—	—	—	—	1245	M	Woodward	3286	11.8

(g) Contains 122 Colorado AUM's managed by the Vernal District.

(h) This allotment contains 425 Colorado AUM's managed by the Vernal District.



Acres	Ecological Condition	(Federal Acres)

(i) 751 AUM's on Lower McCook is included with Sweetwater AMP.

A11-6



Appendix 11 (Continued)  
Allotment Statistics

Ecological Condition										Numbers and Class of Livestock and Wild Horses										Active Average Pref. Use									
(Federal Acres)										Livestock and Wild Horses										(AUM's) MIC* Permittee									
Acres										Season of Use										AUM's (AUM's) MIC* Permittee									
Allotment Name										Present Objective										Full Acres									
Allotment Num. Fed. State Pvt. Exc. Good Fair Poor Outcrop Class Lvstck. 30215 51426										Numbers Numbers N B R R Y N L G P T V C										AUM's Per AUM									
Subtotals										633299 63293 251883 8999 92054 92054 257520 22843 22843 257520 8999 30215 51426										(k)61323 37352 0 480 (k)74079 600									
BOOK CLIFFS LOCALITY																													
Atchee										110296 12745 19463 21696 65596 12201 221 10582 560 715										(1)8584 6727 135 135 10106 12.7									
Ridge AMP										8824										Gentry Benson									
Book Cliffs										5166 18833 314 0 4396 693 0 77 Cattle 80 80										301 300 M DeLambert 301 17.2									
Pastures										8828										Gentry 784 17.0									
(m)Davis										5831 1004 204 79 888 4286 0 578 Cattle										334 334 2346 (n)1398 3342 14.1									
Canyon										8823										(o)138 138 33 33									
Horse Point										33133 3452 2611 2019 11259 15640 0 4215 Cattle 231 608										I Graham 3342 14.1									
AMP										8825										(o)138 138 33 33									
McClelland										15270 42254 1416 2197 10043 2653 0 377 Cattle 196 224										1399 1226 C Graham 1399 10.9									
8826																													

(k)Does not include K Ranch.

(l)This includes 2442 cattle AUM's in Colorado managed by the Vernal District.

(m)This livestock allotment is managed by Colorado.

(n)Agency Draw Pasture has been in nonuse. Request has been made to change class of livestock from sheep to cattle.

(o)Wild horses within the Horse Point Allotment are part of the Hill Creek herd and the AUMs are included with the Hill Creek locality.



Appendix 11 (Continued)  
Allotment Statistics

Allotment Name	Allotment Num.	Acres	Ecological Condition		Numbers and Class of Livestock and Wild Horses		Season of Use	Active Average Pref. Use		Permittee	Full Pref. AUM's	Avg. Acres Per AUM				
			(Federal Acres)					AUM's	(AUM's)							
Badland Rock																
			Fair	Good	Present Numbers	Objective Numbers	J F M A M J J A S O N D									
			Exc.				A E A P A U U E C O E									
					Class	Numbers	N B R R Y N L G P T V C									
Sweetwater AMP	94853	15926	3465	17284	50741	19617	33	7178	Cattle	728	910	(p)7276	5822	I S&H Ranches	8815	11.8
8822																
Westwater Point	5595	693	0	66	3542	1433	0	554	Cattle	87	107	426	349	M Graham	426	13.1
8833																
Winter Ridge AMP	33912	7666	679	140	25390	6732	179	1471	Cattle	165	277	1939	1153	I DeLambert	2277	17.1
8827									Cattle	15	20	40	29	Graham	76	
									W.Horses	9	45	108			540	
Subtotals	304056	28152	171855	433	Lvstck.	2127	3092					(q)23174	17351		q28385	
	102573	43481	63255	25032	W.Horses	39	75					108			540	
HILL CREEK LOCALITY																
Birchell	1712	0	0	0	0	1492	82	138	Cattle	85	85	85	85	I S&H Ranches	108	20.1
8804																
Green River AMP	9002	271	159	0	2478	3316	473	2735	Cattle	97	97	437	436	I S&H Ranches	554	20.6
8803																
Hatch-Broome-Bartholemew	1336	58	585	0	573	370	0	393	Cattle	54	54	107	107	C S&H Ranches	138	12.5
8805																

(p)Includes 751 AUM's on Lower McCook.  
(q)Does not include Davis Canyon



Appendix 11 (Continued)  
Allotment Statistics

Allotment Name	Acres		Ecological Condition (Federal Acres)		Badland Rock		Numbers and Class of Livestock and Wild Horses		Season of Use		Active Average Pref. Use		Permittee		Avg. Acres Per AUM's									
	Allotment Num.	Fed. State Pvt.	Exc.	Good	Fair	Poor	Outcrop	Class	Present Numbers	Objective Numbers	J	F	M	A		M	J	J	A	S	O	N	D	AUM's
Lower Sh-walter (Wild Horse Bench) 8811	18496	3432	0	0	5963	7285	0	5248	Cattle	25	754	1508	50	M	Ute Tribe	1508	12.3						1508	180
									W.Horses	7	15		84											
Oil Shale 8813	14472	4155	22968	0	7147	5600	0	1725	Sheep			1098	(r)0	C	S&H Ranches	1098	13.2						1098	60
									W.Horses	10	10		60										60	30
Pack Mountain-Wild Horse 8808	21457	2298	3	0	13184	1990	1280	5003	Sheep	1328	1775	1775	1328	M	Smith	1775	12.1						2100	120
									W.Horses	10	10		120											
Santio-Sibello 8806	2249	6	1491	0	1390	178	0	681	Cattle	16	16	96	96	C	S&H Ranches	96	23.4						210	
Tabyago 8801	31631	905	0	3273	17432	6047	406	4473	Sheep	1997	2995	2995	1997	M	Boren	2995	10.6						3585	660
									W.Horses	45	55		540											
Thorne-Ute-Broome 8812	3692	928	851	0	3	3010	0	679	Cattle	124	124	248	248	C	Ute Tribe	248	14.9						342	

(r)Request has been made to change class of livestock from sheep to cattle. No use has been made in the last 4 years.







# APPENDIX 12

## METHODOLOGY FOR THE ECONOMIC AND SOCIAL ANALYSIS

### Minerals Analysis

The oil shale related economic impacts are based upon the aggregate production and impacts from the Tosco, Magic Circle, Syntana, and Paraho oil shale projects, described in the Uintah Basin Synfuels Development EIS 1982; and adjusted by the oil shale production estimates for various management actions that were developed for this RMP.

The tar sands related economic impacts were based upon the production and impact estimates for the PR Spring special tar sands area described in the Utah Combined Hydrocarbon Regional Tar Sands EIS, and adjusted by the production estimates resulting from the various management actions that were developed for this RMP.

Each EIS's impact estimates were adjusted using the following ratio:

$$\frac{\text{Production estimate resulting from a management action}}{\text{Production estimate in the EIS}}$$

The resulting population estimates are given in Table 12-1 of this Appendix.

### Wildlife/Recreation Analysis

The number of days associated with hunting and recreational permits in the BCRA was established by the Vernal District Outdoor Recreation Planner in conjunction with the Utah Division of Wildlife Resources.

Expenditure information for recreation visits was calculated from Outdoor Recreation in Utah: The Economic Significance (Utah State University 1982).

### Forage Analysis

The Economic Statistics and Cooperative Service (ESCS), U.S. Department of Agriculture, collected rancher economic data for the USFS and BLM in 1979.

The forage and season of use in the Diamond Mountain Resource Area (DMRA) is similar to that of the Book Cliffs Resource Area (BCRA) and the two resource areas have 6 livestock operators in common. Because of the lack of budgets specific to the BCRA, and the similarities of resource and livestock operations between the 2 resource areas, the DMRA budgets and linear programming results were applied to the BCRA. Although operations in the BCRA tend to be slightly larger, and the analysis is one year old, this and other dissimilarities were not judged to be significant enough to invalidate the analysis.

Producers using BLM forage in the Diamond Mountain Resource Area (DMRA) were stratified according to herd size, season of Federal rangeland use, and dependency on Federal lands for grazing. Average costs and returns for



## Appendix 12 (Continued)

### Methodology for the Economic and Social Analysis

producers in these strata were first based upon U.S. Department of Agriculture cost of production survey data for a broad geographic area including the BCRA. To reflect local conditions, the survey data were adjusted through local producers' panels, extension specialists, lending institutions, and universities. The final ranch budgets for the DMRA are shown in Tables 12-2, 12-3, 12-4, and 12-5 of this Appendix.

Based upon these ranch budgets, a linear programming model was developed for each rancher strata. Models were set up to maximize net income based on a series of production parameters and constraints. The amount of grazing on public lands enters the model at a constrained level equal to that used by each of the typical ranches. The BIM forage constraints were then varied to see how the typical profit-maximizing ranches would adjust to these changes. Average costs, returns, herd size, and hired labor requirements were then computed by rancher strata for 10 through 30 percent increases in available public land forage, and 10 through 50 percent decreases in available public land forage. The results of this modeling are shown in Tables 12-6, 12-7, 12-8, and 12-9 of this Appendix.

Operators in the BCRA were grouped into the same strata used in the linear programming models. Each ranch has a unique set of characteristics affecting its operation which cannot be fully represented by a ranch model. However, the ranch models can be used to estimate the aggregate impacts of changing the allocation of public land forage to those ranches in each stratum.

Impacts were estimated assuming that those operations using less than 90 percent of their full active preference would continue grazing at their 5-year average licensed use. Therefore, only when a management action reduced the level of use below an operator's 5-year average was a decrease in income recorded. This assumption tends to underestimate the rancher impacts of each alternative. Increases in forage use were recorded either when a management action would increase the forage allocated to an operator, using 90 percent or more of active preference, or anytime when a range improvement would increase available livestock forage.

The changes in forage availability were evaluated by assuming that the changes would be uniform throughout the existing period of use. Changes in season of use constrain the periods that operators can use public forage. These changes were not evaluated by ESCS or through linear program modeling. The proposed changes in season of use most consistently exclude grazing during some periods in the spring (March through May). Spring is also the period when ranchers have the fewest alternative sources of forage.

The average licensed use that would be excluded during the spring under each alternative was estimated for all operators. This figure was adjusted for each alternative according to the herd size change predicted by the linear programming model. To calculate the worst-case impact of these changes, it was assumed that this forage loss would be replaced with alfalfa hay produced



## Appendix 12 (Continued)

### Methodology for the Economic and Social Analysis

at \$60 per ton. It was further assumed that an animal unit month (AUM) of public forage supplied to a typical herd combination during the spring would have to be replaced with 730 pounds of alfalfa hay.

Changes in hired labor requirements were computed using the predicted expenditures for hired labor and the average income for farm laborers in Uintah County.

Direct operator income changes were calculated using linear programming estimated returns above cash cost. Indirect and induced income changes were calculated using an input-output model for Uintah-Duchesne Counties. Returns above cash cost were not used to measure induced effects, since induced impacts are determined by reportable income, which is less than returns above cash costs. Reportable income was measured from changes in livestock sales and the income-to-sales ratio in the input-output model. Indirect and induced effects were, therefore, based on changes in sales that would result from each alternative.

Although BLM does not recognize a capitalized value for grazing preferences, the market does recognize such a capitalized value whenever grazing fees are lower than their economic value (Gardner 1962). Grazing fees represent a minimum value for public forage; however, the grazing fee is not determined through the market, and it is generally agreed that the fee is lower than its true economic value (USDA, USDI 1977). Although there are numerous restrictions preventing the outright sale of permits, those in the livestock business sometimes mention grazing permit sales, and although the prices are highly variable, they are generally near the \$40 to \$80/AUM price range. Although forage quality, season of use, and added services rendered make comparisons between BLM forage and privately leased forage questionable, private lease rates still provide one of the best measures of annual value. Utah's private lease rate averaged \$7.24 per AUM in 1982 (USDA 1983). There are a number of other indications that the value of public forage in the BCRA is close to \$7.24 per AUM figure (Gee 1981, USFS 1980). With an annual permit value of \$7.24, a 5-year average grazing fee of \$1.96 (1979-1983) and a discount rate of  $7\frac{7}{8}$ , economic theory suggests that permit values would be \$69 per AUM.

### Social Analysis

The existing social conditions of communities and groups in the affected area was obtained from various published and unpublished sources. The attitudes of various groups towards each issue was obtained from the resource area specialists. These specialists live in the affected area and have worked and dealt with members of those groups who have major interest in the issues. Precise representation of the communities was not possible through this information gathering technique; however, major social concerns and effects were identified for each issue.



Appendix 12, Table 12-1  
Baseline, Interrelated and BLM Related Population Growth  
By Alternative

	1980				1985				1990				1995				2000				Resource Protection Alternative				Commodity Production Alternative				Balanced Use Alternative							
	Base		Other		Base		Other		Base		Other		Base		Other		Base		Other		1985		1990		1995		2000		1985		1990		1995		2000	
Duchesne	12,565	17,778	4,965	18,632	9,542	18,684	12,333	18,292	14,910	0	1,181	1,900	1,900	1,900	0	2,575	4,135	4,135	4,135	0	2,049	3,296	3,296	0	2,049	3,296	3,296	0	2,049	3,296	3,296	0	2,049	3,296	3,296	
Roosevelt CCD	9,714	13,695	4,897	15,057	9,404	15,005	12,190	14,636	14,701	0	1,169	1,881	1,881	1,881	0	2,549	4,093	4,093	4,093	0	2,029	3,263	3,263	0	2,029	3,263	3,263	0	2,029	3,263	3,263	0	2,029	3,263	3,263	
Roosevelt	3,842	5,416	3,428	5,995	6,582	5,934	8,533	5,789	10,291	0	814	1,311	1,311	1,311	0	1,759	2,824	2,824	2,824	0	1,414	2,274	2,274	0	1,414	2,274	2,274	0	1,414	2,274	2,274	0	1,414	2,274	2,274	
Myton	500	705	171	775	329	773	427	754	515	0	35	57	57	57	0	53	85	85	85	0	61	99	99	0	61	99	99	0	61	99	99	0	61	99	99	
Unincorp. Area	5,372	7,574	1,298	8,287	2,493	8,298	3,230	8,093	3,895	0	318	513	513	513	0	737	1,184	1,184	1,184	0	554	890	890	0	554	890	890	0	554	890	890	0	554	890	890	
Duchesne & S & N																																				
Duchesne CCD	2,851	4,083	68	3,575	138	3,679	143	3,656	209	0	12	19	19	19	0	26	42	42	42	0	20	33	33	0	20	33	33	0	20	33	33	0	20	33	33	
Uintah	20,506	25,730	18,940	29,326	34,690	29,863	44,174	28,985	52,445	0	8,020	12,923	12,923	12,923	0	17,520	28,127	28,127	28,127	0	13,942	22,425	22,425	0	13,942	22,425	22,425	0	13,942	22,425	22,425	0	13,942	22,425	22,425	
Uintah-Ouray																																				
CCD	4,338	5,061	445	5,699	830	5,730	926	5,565	1,027	0	160	258	258	258	0	526	562	562	562	0	418	449	449	0	418	449	449	0	418	449	449	0	418	449	449	
Ballard	558	775	223	966	416	976	464	926	514	0	80	129	129	129	0	175	281	281	281	0	139	224	224	0	139	224	224	0	139	224	224	0	139	224	224	
Unincorp. Area	3,780	4,286	222	4,733	414	4,754	462	4,639	513	0	80	129	129	129	0	351	281	281	281	0	279	225	225	0	279	225	225	0	279	225	225	0	279	225	225	
Vernal CCD	16,168	20,653	13,858	23,611	32,011	24,117	43,041	23,404	51,209	0	5,774	12,406	12,535	12,535	0	12,614	27,002	27,002	27,283	0	10,038	21,528	21,752	0	10,038	21,528	21,752	0	10,038	21,528	21,752	0	10,038	21,528	21,752	
Vernal	6,600	9,291	6,165	11,065	13,918	11,369	18,786	10,941	22,328	0	2,566	5,557	5,686	5,686	0	5,606	12,095	12,095	12,376	0	4,461	9,642	9,867	0	4,461	9,642	9,867	0	4,461	9,642	9,867	0	4,461	9,642	9,867	
Unincorp. Area	9,568	11,362	12,330	12,546	19,942	12,748	24,462	12,463	29,090	0	3,208	6,849	6,849	6,849	0	7,008	14,907	14,907	14,907	0	5,577	11,886	11,885	0	5,577	11,886	11,885	0	5,577	11,886	11,885	0	5,577	11,886	11,885	
Bonanza*	16	4,637	16	1,849	16	1,849	207	16	209	0	2,086	259	130	130	0	4,380	563	563	280	0	3,486	448	224	0	3,486	448	224	0	3,486	448	224	0	3,486	448	224	
Moffat-Rio Blanco	24,255	1,176	28,345	3,004	27,646	3,837	28,144	4,518	0	281	425	452	452	0	613	984	984	984	0	488	775	775	0	488	775	775	0	488	775	775	0	488	775	775		
Dinosaur	410	501	517	405	1,367	425	1,744	437	2,055	0	124	187	187	187	0	343	551	551	551	0	215	440	440	0	215	440	440	0	215	440	440	0	215	440	440	
Rangely	2,614	3,193	659	3,993	1,637	3,805	2,093	3,962	2,463	0	157	238	238	238	0	270	433	433	433	0	273	335	335	0	273	335	335	0	273	335	335	0	273	335	335	
Grand	8,241	9,850	691	10,570	834	10,324	915	9,676	919	0	155	1,156	441	441	0	830	6,215	6,215	2,372	0	522	3,916	1,494	0	522	3,916	1,494	0	522	3,916	1,494	0	522	3,916	1,494	
Thompson CCD	326	380	691	366	834	366	915	365	919	0	155	1,156	441	441	0	830	6,215	6,215	2,372	0	522	3,916	1,494	0	522	3,916	1,494	0	522	3,916	1,494	0	522	3,916	1,494	
Moab CCD	7,915	9,470	-	10,204	-	9,958	-	9,311	-	0	-	-	-	-	0	-	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-	0	-	-	-	
Daggett Co., Utah & Mesa Co., Colo.			1,510		1,198		1,731		2,185	0	193	410	410	410	0	424	987	987	987	0	340	760	760	0	340	760	760	0	340	760	760	0	340	760	760	

Note: Daggett County, Utah and Mesa County, Colorado are not within the affected area as the term is used in the text.

\*Bonanza does not correspond with any official census area, but is roughly the area delineated by the BCRA.



Ranch Budgets

APPENDIX 12, TABLE 12-2

Average Costs and Returns for Small Beef Herds (0-99 Cows)

Item	Unit	Number	Average Weight	Price Cwt	Total Value
<b>Sales:</b>					
Steer Calves	Head	20	390	\$86.13	\$ 6,718
Heifer Calves	Head	10	375	77.49	2,906
Yearling Steers	Head	--	--	--	--
Yearling Heifers	Head	3	650	65.47	1,277
Cull Cows	Head	6	850	41.27	2,105
Total					13,006
Total Per Cow					250
<b>Cash Costs:</b>					
			Value/Cow	Total Values	
BIM Grazing Fee			\$ 7.85	\$ 408	
Forest Grazing Fee			6.12	318	
Private Range Lease/Rent			9.97	518	
State Lease			1.26	65	
Hay (produce)			13.57	706	
Hay (purchase)			--	--	
Protein Supplement			--	--	
Irrigated Pasture			5.50	286	
Salt and Mineral			1.40	73	
Concentrate Feeds			--	--	
Veterinary and Medicine			3.75	195	
Hired Trucking			3.83	199	
Marketing			3.71	193	
Fuel and Lubricants			27.20	1,414	
Repairs			23.84	1,239	
Taxes			26.89	1,398	
Insurance			6.72	349	
Interest on Operating Capital			6.86	357	
General Farm Overhead			11.42	594	
Other Cash Costs			--	--	
Hired Labor			.94	49	
Total Cash Costs			160.79	8,361	
<b>Other Costs:</b>					
Family Labor			44.84	2,332	
Depreciation			49.43	2,570	
Interest on Investment Other Than Land			117.42	6,106	
Interest on Land			385.01	20,021	
Total Other Costs			596.72	31,029	
Total All Costs			\$757.50	\$39,390	

Source: Gee 82



# Ranch Budgets

## APPENDIX 12, TABLE 12-3

### Average Costs and Returns for Medium Beef Herds (100-299 Cows)

Item	Unit	Number	Average Weight	Price Cwt	Total Value
<u>Sales:</u>					
Steer Calves	Head	70	390	\$86.13	\$23,629
Heifer Calves	Head	24	375	77.49	6,974
Yearling Steers	Head	8	670	72.58	3,901
Yearling Heifers	Head	20	650	65.47	8,511
Cull Cows	Head	28	850	41.27	9,822
Total					52,832
Total Per Cow					262
<hr/>					
<u>Cash Costs:</u>			Value/Cow	Total Values	
BIM Grazing Fee			\$ 3.26	\$	655
Forest Grazing Fee			4.44		892
Private Range Lease/Rent			13.33		2,679
State Lease			1.34		269
Hay (produce)			10.72		2,155
Hay (purchase)			4.31		866
Protein Supplement			--		--
Irrigated Pasture			11.70		2,352
Salt and Mineral			1.40		281
Concentrate Feeds			--		--
Veterinary and Medicine			4.95		995
Hired Trucking			1.70		342
Marketing			2.15		432
Fuel and Lubricants			22.33		4,488
Repairs			21.63		4,348
Taxes			24.16		4,856
Insurance			6.50		1,307
Interest on Operating Capital			8.40		1,688
General Farm Overhead			10.05		2,020
Other Cash Costs			--		--
Hired Labor			13.35		2,683
Total Cash Costs			165.72		33,308
<hr/>					
<u>Other Costs:</u>					
Family Labor			25.90		5,206
Depreciation			49.00		9,849
Interest on Investment Other Than Land			117.07		23,531
Interest on Land			344.55		69,255
Total Other Costs			\$536.52		\$107,841
Total All Costs					\$141,150

Source: Gee 82



# Ranch Budgets

## APPENDIX 12, TABLE 12-4

### Average Costs and Returns for Large Beef Herds (over 300 Cows)

Item	Unit	Number	Average Weight	Price Cwt	Total Value
<u>Sales:</u>					
Steer Calves	Head	260	390	\$86.13	\$ 87,282
Heifer Calves	Head	101	375	77.49	29,349
Yearling Steers	Head	52	670	72.58	25,287
Yearling Heifers	Head	93	650	65.47	39,577
Cull Cows	Head	119	850	41.27	41,744
Total					223,239
Total Per Cow					263
<hr/>					
<u>Cash Costs:</u>			<u>Value/Cow</u>	<u>Total Values</u>	
BIM Grazing Fee			\$ 2.29	\$	1,940
Forest Grazing Fee			10.57		8,953
Private Range Lease/Rent			14.79		12,527
State Lease			1.50		1,271
Hay (produce)			10.86		9,198
Hay (purchase)			4.15		3,515
Protein Supplement			--		--
Irrigated Pasture			12.93		10,952
Salt and Mineral			1.40		1,186
Concentrate Feeds			--		--
Veterinary and Medicine			1.55		1,313
Hired Trucking			1.85		1,567
Marketing			2.10		1,779
Fuel and Lubricants			10.75		9,105
Repairs			14.38		12,180
Taxes			27.01		22,877
Insurance			6.83		5,785
Interest on Operating Capital			6.99		5,921
General Farm Overhead			7.72		6,539
Other Cash Costs			--		--
Hired Labor			18.71		15,847
Total Cash Costs			156.38		132,454
<u>Other Costs:</u>					
Family Labor			12.35		10,460
Depreciation			48.65		41,207
Interest on Investment Other Than Land			112.77		95,516
Interest on Land			321.48		272,294
Total Other Costs			\$495.25		\$419,477

Source: Gee 82



Ranch Budgets

APPENDIX 12, TABLE 12-5

Average Costs and Returns for Large Sheep Herds

Item	Unit	Number	Average Weight	Price Cwt	Total Value
<b>Sales:</b>					
Slaughter Lambs	Head	1,621	93	\$66.30	\$ 99,949
Feeder Lambs	Head	835	82	73.96	50,640
Ewes	Head	278	145	26.86	10,827
Wool	Ibs.	2,831	10	.88	24,913
Wood Incentive Payment	Dol.	24,913		.39	9,716
Unshorn Lamb Payment	Cwt.	2,193		1.43	3,136
Total					199,181
Total Per Cow					71

Cash Costs:	Value/Cow	Total Values
BIM Grazing Fee	\$ 1.59	\$ 4,430
Forest Grazing Fee	1.57	4,360
State Lease	.25	708
Irrigated Pasture	--	--
Private Range Lease/Rent	2.52	7,014
Hay (produce)	.51	1,417
Hay (purchase)	1.82	5,061
Grain	--	--
Protein Supplement	1.33	3,694
Other Feed	--	--
Salt and Mineral	.28	778
Spray and Dipping	.02	58
Veterinary and Medicine	.36	1,001
Marketing	.10	278
Trucking	2.44	6,783
Shearing and Tagging	1.90	5,282
Utilities	.63	1,751
Lamb Promotion	.03	83
Organizations	.10	278
Legal and Accounting	.38	1,057
Wool Storage	.08	222
Predator Control	.67	1,862
Ram Death Loss	.59	1,640
Fuel and Lurbicants	1.78	4,948
Repairs	1.72	4,787
Hired Labor	3.47	9,647
Taxes	2.81	7,807
Insurance	.65	1,810
General Farm Overhead	1.19	3,308
Interest on Operating Capital	1.37	3,815
Total Cash Costs	\$30.17	\$83,878

Source: Gee 82



Appendix 12, Table 12-6

Impact Analysis on Partial Ranch Budgets for Small Cattle Operator

Item	No Change	Percent Increased			Percent Reduced		
		10	20	30	10	20	30
		<u>Dollars</u>					
Gross Income	13,006	13,181	13,367	13,542	12,582	12,134	11,710
Total Cash Costs	8,361	8,450	8,545	8,634	8,089	7,800	7,527
Value of Family Labor	2,332	2,363	2,396	2,428	2,256	2,175	2,099
Depreciation	2,570	2,576	2,582	2,587	2,556	2,542	2,528
Interest on Investment Other Than Land	6,106	6,163	6,224	6,282	5,967	5,820	5,682
Return Above:							
Cash Costs	4,645	4,731	4,822	4,908	4,493	4,334	4,183
Cash Costs and Family Labor	2,313	2,368	2,426	2,480	2,237	2,159	2,084
Return to Total Investment	-257	-208	-156	-107	-319	-383	-444
Return to Land	-6,363	-6,371	-6,380	-6,389	-6,286	-6,203	-6,126
		<u>Head</u>					
Herd Size	52	53	53	54	50	49	47



Appendix 12, Table 12-7

Partial Ranch Budgets and Impact Analysis for Medium Cattle Operator

Item	No Change	Percent Increased			Percent Reduced		
		10	20	30	10	20	30
		<u>Dollars</u>					
Gross Income	52,832	53,301	53,769	54,238	52,141	51,451	50,760
Total Cash Costs	33,308	33,670	34,032	34,394	33,188	33,068	32,947
Value of Family Labor	5,206	5,234	5,261	5,289	5,128	5,050	4,972
Depreciation	9,849	9,851	9,854	9,856	9,821	9,794	9,766
Interest on Investment Other Than Land	23,531	23,617	23,702	23,788	23,275	23,019	22,762
Return Above:							
Cash Costs	19,523	19,630	19,737	19,844	18,953	18,383	17,812
Cash Costs and Family Labor	14,317	14,396	14,476	14,555	13,825	13,333	12,840
Return to Total Investment	4,468	4,545	4,622	4,699	3,755	3,042	2,329
Return to Land	-64,786	-49,554	-34,321	-19,089	-55,850	-46,914	-37,977
		<u>Head</u>					
Herd Size	201	202	203	204	198	195	192



Appendix 12, Table 12-8

Partial Ranch Budgets and Impact Analysis for Large Cattle Operator

Item	No Change	Percent Increased			Percent Reduced					
		10	20	30	10	20	30	40	50	
<u>Dollars</u>										
Gross Income	223,239	223,473	223,708	223,942	222,998	222,757	222,517	222,276	222,035	
Total Cash Costs	132,454	131,647	130,839	130,032	133,549	134,645	135,740	136,836	137,931	
Value of Family Labor	10,460	10,089	9,719	9,348	10,209	9,958	9,706	9,455	9,204	
Depreciation	41,207	40,979	40,751	40,523	41,059	40,911	40,762	40,614	40,466	
Interest on Investment Other Than Land	95,516	95,627	95,738	95,849	95,469	95,422	95,376	95,329	95,282	
Return Above:										
Cash Costs	90,785	91,827	92,868	93,910	89,449	88,113	86,776	85,440	84,104	
Cash Costs and Family Labor	80,325	81,737	83,149	84,561	78,148	75,971	73,795	71,618	69,441	
Return to Total Investment	39,118	40,758	42,398	44,038	37,089	35,061	33,032	31,004	28,975	
Return to Land	-233,176	-172,721	-112,266	-51,811	-198,710	-164,245	-129,779	-95,314	-60,848	
<u>Head</u>										
Herd Size	847	848	849	850	846	845	844	843	842	



Appendix 12, Table 12-9

Partial Ranch Budgets and Impact Analysis for Sheep Operators

Item	No Change	Percent Increased			Percent Reduced		
		10	20	30	10	20	30
		<u>Dollars</u>					
Gross Income	199,181	202,898	206,591	210,305	195,471	191,778	188,065
Total Cash Costs	83,878	84,804	85,013	85,224	84,383	84,173	83,963
Value of Family Labor	9,647	9,826	10,005	10,185	9,467	9,288	9,108
Depreciation	19,774	19,812	19,851	19,889	19,736	19,697	19,659
Interest on Investment Other Than Land	40,101	40,593	41,082	41,574	39,609	39,119	38,627
Return Above:							
Cash Costs	115,303	118,094	121,578	125,081	111,088	107,605	104,102
Cash Costs and Family Labor	105,656	108,268	111,573	114,896	101,621	98,317	94,994
Return to Total Investment	85,882	88,456	91,722	95,007	81,885	78,620	75,335
Return to Land	45,781	47,863	50,640	53,433	42,276	39,501	36,708
		<u>Head</u>					
Herd Size	2,780	2,832	2,883	2,935	2,728	2,676	2,624



# **APPENDIX 13**

## **PREVENTION OF SIGNIFICANT DETERIORATION REGULATIONS AND NATIONAL AMBIENT AIR QUALITY STANDARDS.**

### **Ambient Air Quality Standards**

The applicable State and Federal ambient air quality standards are listed. The Utah and Colorado State standards are the same as the National Ambient Air Quality Standards.

All ambient air quality standards are of potential concern; however, for the region and sources of interest, sulfur dioxide ( $\text{SO}_2$ ), total suspended particulates (TSP), nitrogen dioxide ( $\text{NO}_2$ ), carbon monoxide (CO), and ozone ( $\text{O}_3$ ) are the pollutants of principal concern.

Federal, Utah, and Colorado ambient air quality standards are displayed in Table 13-1.

### **Prevention of Significant Deterioration**

The United States Environmental Protection Agency and State of Utah prevention of significant deterioration requirements both allow only a limited increase in the second-highest short-term TSP and  $\text{SO}_2$  concentrations, and annual-average TSP and  $\text{SO}_2$  concentrations associated with emissions from a new source. These  $\text{SO}_2$  and TSP increments for each class are listed in Table 13-2.



TABLE 13-1

Applicable State and Federal Ambient Air Quality Standards  
(micrograms per cubic meter)

<u>Pollutant</u>	<u>Federal</u>	<u>Utah</u>	<u>Colorado</u>
Sulfur Dioxide ( $\text{SO}_2$ )			
(annual)	80	80	80
(24-hour)	365	365	365
(3-hour secondary)	1,300	1,300	1,300
Total Suspended Particulates (TSP)			
Primary			
(annual)	75	75	75
(24-hour)	260	260	260
Secondary			
(annual)	60	60	60
(24-hour)	150	150	150
Carbon Monoxide (CO)			
(8-hour)	10,000	10,000	10,000
(1-hour)	40,000	40,000	40,000
Ozone ( $\text{O}_3$ )			
(1-hour)	240	240	240
Nitrogen Oxide ( $\text{NO}_2$ )			
(annual)	100	100	100



TABLE 13-2

## Prevention of Significant Deterioration Increments

<u>Pollutant</u>	<u>Averaging Time</u>	Maximum Allowable Concentrations ( $\mu\text{g}/\text{m}^3$ )		
		<u>Class I</u>	<u>Class II</u>	<u>Class III</u>
$\text{SO}_2$	Annual	2	20	40
	24-hr	5	91	182
	3-hr	25	512	700
TSP	Annual	5	19	37
	24-hr	10	37	75







# APPENDIX 14

## ANTICIPATED TREND IN ECOLOGICAL CONDITIONS

### LEGEND

Apparent Trend: D = Down S = Stable U = Up

Factors Considered to Appraise and Assign Trend to Ecological Condition

1. Large amounts of nonuse = U
2. Deferment of use during the critical plant growth periods = U
3. Vegetative studies show a current downward trend = D
4. Vegetative studies show a current upward trend = U
5. Grazing system to defer use during critical plant growth periods = U
6. Current trend is static or studies are incomplete = S
7. Land treatments = U
8. Development of water to improve distribution = U
9. Ongoing field observations = U or D or S
10. Continuous season long use = D
11. Utilization and actual use studies show heavy use
12. Wildlife numbers are above the level allocated for
13. Decrease in wild horse use
14. Increase in wild horse use

Allotment Name and Number	Current Management				Anticipated Trend			
	Apparent Trend	Factors	Trend	Apparent Trend	Protection Trend	Commodity Apparent Trend	Production Trend	Balanced Use Apparent Trend
BLUE MOUNTAIN LOCALITY								
Blue Mountain AMP 5825	D	3, 11, 12	U	U	2	5, 7, 8	U	5, 7, 8
Cub Creek 5823	S	6	S	S	6	6	S	6
Doc's Valley 5821	S	6	U	U	2	5, 7	U	5, 7
Green River 5820	S	6	U	S	2	6	S-U	1, 6
Point of Pines 5822	D	3, 11, 12	U	U	2	5, 7, 8	U	5, 7, 8
Stuntz Valley 5824	D	3, 11, 12	U	U	2	5, 7	U	5, 7, 8



# Appendix 14 (Continued)

## Anticipated Trend in Ecological Condition

Allotment Name and Number	Current Management				Anticipated Trend				Balanced Use			
	Apparent Trend	Trend Factors	Resource Apparent Trend	Protection Trend Factors	Commodity Apparent Trend	Production Trend Factors	Apparent Trend	Trend Factors	Apparent Trend	Trend Factors		
BONANZA-RAINBOW LOCALITY												
Antelope Draw	5854	U	1, 4	U	1, 2, 4	U	4, 5, 8, 13	U	4, 5, 8, 13	U	4, 5, 8, 13	
Asphalt Draw AMP	8817	U	1	U	1, 2	U	5, 8	U	5, 8	U	5, 8	
Badlands	5848	D	9, 10	U	2	S	6	U	5, 8	U	5, 8	
Baerer Wash	5832	S	6	U	2	U	5	U	5	U	5	
Bohemian Bottoms	5840	S	6	U	2	S	6	S	6	S	6	
Bonanza	5842	S	6	U	2	U	5	U	5	U	5	
Brewer	8831	S	6	U	2	S	6	S	6	S	6	
Cocklebur	5833	S	6	U	2	U	5	U	5	U	5	
Halfway Hill	5861	S	6	U	2	U	5	U	5	U	5	
Hells Hole	8819	U	1	U	1, 2	S	6	S-U	1-6	S-U	1-6	
Jensen	5836	D	9, 10	U	2	U	5, 8	U	5, 8	U	5, 8	
K Ranch**	5849											
Kane Hollow	5837	D	9, 10	U	2	U	5, 8	U	5, 8	U	5, 8	
Little Emma	5852	S-U	6	U	2	S	6	S-U	1, 6	S-U	1, 6	
Miners Gulch	5838	S	6	U	2	S	6	S	6	S	6	
Olsen AMP	8816	S-U	1, 6	U	2	S	5, 6	S-U	1, 5, 6	S-U	1, 5, 6	
Powder Wash	5857	S	6	U	2	U	5, 8	U	5, 8	U	5, 8	
Raven Ridge	5851	S	6	U	2	U	7	U	7	U	7	
Sand Wash	8818	S-U	1-6	U	2	S	6	S-U	1, 6	S-U	1, 6	
Seven Sisters AMP	5845	S	6	U	2	U	5, 13	U	5, 13	U	5, 13	
Snake John	5860	S	6	U	2	U	5	U	5	U	5	
Spring Hollow	5862	D	3, 9	U	2	S	6	U	5, 8	U	5, 8	
Stateline	5863	S-U	1, 6	U	1, 2	S	6	U	1-6	U	1-6	
Stirrup AMP	5847	S	6	U	2	S	5, 6	U	5, 6	U	5, 6	

\*\*Allotment managed by Colorado



Appendix 14 (Continued)

Anticipated Trend in Ecological Condition

Allotment Name and Number	Anticipated Trend							
	Current Management Apparent Trend	Management Trend Factors	Resource Apparent Trend	Protection Trend Factors	Commodity Apparent Trend	Production Trend Factors	Balanced Use Apparent Trend	Use Trend Factors
Sunday School Canyon AMP 8814	S	6	U	2	U	5, 8	U	5, 8
Walker Hollow AMP 5839	S	6	S	6	U	5, 8	U	5, 8
Watson 8815	S	6	U	2	S	6	S-U	1, 6
West Deadman 5841	S-U	1, 6	U	1, 2	S	6	S-U	1, 6
White River 8829	S	6	S	6	S	6	S	6
White River Bottoms 5850	S	6	U	2	S	6	S	6
BOOK CLIFFS LOCALITY								
Atchee Ridge AMP 8824	U	4, 5	U	2, 4, 5	U	4, 5, 7, 8	U	4, 5, 7, 8
Book Cliffs Pasture 8828	S	6	S	6	S	6	S	6
Davis Canyon** 8823	S-U	1, 6	U	1, 2	U	5, 7, 8, 13	U	5, 7, 8
Horse Point AMP 8825	S	6	U	2	S	6	S	6
McClelland 8826	U	4, 5	U	1, 4, 5	U	5, 7, 8	U	5, 7, 8
Sweetwater AMP 8822	S	6	S	6	S	6	S	6
West Water Point 8833	S	6	U	2	U	5, 7, 13	U	5, 7, 8, 13
Winter Ridge AMP 8827	S	6	U	2	U	5, 7, 13	U	5, 7, 8, 13
HILL CREEK LOCALITY								
Birchell 8804	S	6	U	2	U	5, 7	U	5, 7
Green River AMP 8803	S	6	U	2	S	5, 6	S-U	5, 6

\*\*Allotment managed by Colorado



# Appendix 14 (Continued)

## Anticipated Trend in Ecological Condition

Allotment Name and Number	Current Management				Anticipated Trend				Balanced Use	
	Apparent Trend	Factors	Apparent Trend	Protection Trend	Commodity Apparent Trend	Production Trend	Factors	Apparent Trend	Use Trend	Factors
Hatch-Broome-Bartholomew	S	6	U	2	S	6		S	6	
Lower Showalter (Wild Horse Bench)	S-U	1, 6	S-U	1, 6, 14	S-U	13		S	1, 6, 14	
Oil Shale	U	1, 6	U	1, 6	S-U	6, 13		S	1, 6, 14	
Pack Mountain - Wildhorse	S	6	S-U	2	S-U	13		S	6	
Santio Sibello	S	6	U	2	S	6		S	6	
Tabyago	S	6	S-U	2, 14	U	7, 13		S	1, 6, 14	
Thorne-Ute-Broome	S	6	U	2	S	6		S	6	
Upper Showalter (Mustange)	S	6	U	2, 14	U	7, 13		U	1, 7, 14	
Ute	S-U	1, 6	U	1, 2, 14	U	7, 13		S	1, 6, 14	
West Tabyago AMP	S	6	S-U	2, 14	S-U	1, 5, 13		S-U	1, 5, 14	



# APPENDIX 15

## FORAGE IMPACTS

Section A: Potential Acre Impacts as the Result of Minerals Development by Mineral and by Alternative  
 Section B: Potential Impacts to Livestock by Alternative, Expressed in AUMs.  
 Section C: Potential Impacts to Wildlife, by Alternative, Expressed in AUMs.

### SECTION A

### LEGEND

CM = Current Management Alternative RP = Resource Protection Alternative CP = Commodity Production Alternative BU = Balanced Use Alternative

Allotment Name and Number	Tar Sands			Oil Shale			Oil and Gas			Sand and Gravel			Gilsonite		
	CM	RP	CP	BU	CM	RP	CP	BU	CM	RP	CP	BU	CM	RP	CP

#### BLUE MOUNTAIN LOCALITY

Blue Mountain AMP	5825	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cub Creek	5823	0	0	0	0	0	-4	-4	-4	0	0	0	0	0	0	0	0
Doc's Valley	5821	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Green River	5820	0	0	0	0	0	-91	-91	-91	0	0	-28	0	0	0	0	0
Point of Pines	5822	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Stuntz Valley	5824	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal		0	0	0	0	0	-95	-95	-95	0	0	-28	0	0	0	0	0

#### BONANZA-RAINBOW LOCALITY

Antelope Draw	5854	0	0	0	0	0	-335	-335	-335	0	0	0	0	-5	-5	-5	-5
Asphalt Draw AMP	8817	0	0	-490	0	-506	-365	-177	-183	-183	-183	-17	0	-18	-18	-18	-18
Badlands	5848	0	0	0	0	0	0	0	-61	-61	-61	0	0	0	0	0	0
Baerer Wash	5832	0	0	0	0	0	0	0	-71	-71	-71	0	0	0	0	0	0
Bohemian Bottoms	5840	0	0	0	0	0	0	0	-44	-44	-44	0	0	0	0	0	0
Bonanza	5842	0	0	0	0	0	-148	0	-109	-109	-109	0	0	-13	-13	-13	-13
Brewer	8831	0	0	0	0	0	0	0	-13	-13	-13	0	0	0	0	0	0
Cockleburrr	5833	0	0	0	0	0	0	0	-88	-88	-88	0	0	0	0	0	0
Halfway Hill	5861	0	0	0	0	0	0	0	-37	-37	-37	0	-60	0	0	0	0



Appendix 15 (Continued)  
Forage Impacts

Allotment Name and Number	Tar Sands			Oil Shale			Oil and Gas			Sand and Gravel			Gilsonite		
	CM	RP	CP	BU	CM	RP	CP	RP	CP	BU	CM	RP	CP	RP	BU
Hells Hole	0	0	0	0	0	0	-13	-21	-123	-123	-123	-123	-123	-4	-4
Jensen	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
K-Ranch	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kane Hollow	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Little Emma	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Miners Gulch	0	0	0	0	0	0	-752	-395	-633	-235	-235	-235	-235	-18	-18
Olsen AMP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Powder Wash	0	0	0	0	0	0	-905	-395	-557	-493	-493	-493	-493	-18	-18
Raven Ridge	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sand Wash	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Seven Sisters	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Snake John	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Spring Hollow	0	0	0	0	0	0	-129	-190	-177	-75	-75	-75	-75	-18	-18
Stateline	0	0	0	0	0	0	-110	-177	-75	-75	-75	-75	-75	0	0
Stirrup AMP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sunday School	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Canyon AMP	0	0	0	0	0	0	-395	-431	-199	-199	-199	-199	-199	0	0
Walker Hollow	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Watson	0	0	0	0	0	0	-37	-49	-14	-38	-38	-38	-38	-6	-6
West Deadman	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
White River	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
White River Bottoms	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Subtotal	0	0	0	0	0	0	-500	-2200	-2012	-3011	-3011	-3011	-3011	-108	-108
BOOK CLIFFS LOCALITY															
Atchee Ridge AMP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Book Cliffs Pasture	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Davis Canyon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Horse Point AMP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
McTalland	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sweetwater AMP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

\*Sand and gravel impacts for the White River Bottoms Allotment are included in the Asphalt Draw, Hells Hole, Little Emma, Olsen, and Seven Sisters Allotments.



Appendix 15 (Continued)  
Forage Impacts

Allotment Name and Number	Tar Sands				Oil Shale				Oil and Gas				Sand and Gravel				Gilsonite			
	CM	RP	CP	BU	CM	RP	CP	BU	CM	RP	CP	BU	CM	RP	CP	BU	CM	RP	CP	BU
West Water Point	8833	0	0	0	0	0	0	0	0	-27	-27	-27	0	0	0	0	0	0	0	0
Winter Ridge	8827	0	-10	-4730	-6	0	0	0	0	-161	-161	-161	0	0	0	0	0	0	0	0
Subtotal		0	-2180	-18090	-5606	0	0	-188	0	-1445	-1445	-1445	0	0	0	0	-15	-15	-15	-15
HILL CREEK LOCALITY																				
Birchell	8804	0	0	0	0	0	0	0	0	-8	-8	-8	0	0	0	0	-7	-7	-7	-7
Green River AMP	8803	0	0	0	0	0	0	0	0	-43	-43	-43	0	0	-22	0	-1	-1	-1	-1
Hatch-Broome-																				
Bartholomew	8805	0	0	0	0	0	0	0	0	-6	-6	-6	0	0	0	0	0	0	0	0
Lower Showalter																				
(Wild Horse Bench)	8811	0	0	0	0	0	0	0	0	-88	-88	-88	0	0	0	0	0	0	0	0
Oil Shale	8813	0	0	0	0	0	0	0	0	-69	-69	-69	0	0	0	0	0	0	0	0
Pack Mountain -																				
Wildhorse	8808	0	0	0	0	0	0	0	0	-102	-102	-102	0	0	0	0	-3	-3	-3	-3
Santio Sibello	8806	0	0	0	0	0	0	0	0	-11	-11	-11	0	0	0	0	0	0	0	0
Tabyago	8801	0	0	0	0	0	0	0	0	-51	-51	-51	0	0	0	0	-1	-1	-1	-1
Thorne-Ute-																				
Broome	8812	0	0	0	0	0	0	0	0	-17	-17	-17	0	0	0	0	0	0	0	0
Upper Showalter																				
(Mustange)	8810	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ute	8809	0	0	0	0	0	0	0	0	-32	-32	-32	0	0	0	0	0	0	0	0
West Tabyago AMP	8807	0	0	0	0	0	0	0	0	-22	-22	-22	0	0	0	0	0	0	0	0
Subtotal		0	0	0	0	0	0	0	0	-449	-449	-449	0	0	-22	0	-12	-12	-12	-12
TOTALS		0	-2180	-22260	-6576	0	-2200	-2200	-2200	-5000	-5000	-5000	0	0	-550	-250	-135	-135	-135	-135



SECTION B

Potential Impacts to Livestock by Alternatives  
Expressed in AUMs

Current Management Alternative  
Average Impacts

Livestock AUM's

Allotment Name and Number	Tar Sands	Oil Shale	Oil and Gas	Sand and Gravel	Gil-son-ite	Total Mineral Impacts	Land Treatments	AUM's for Wild-Horses	AUM's		
									From Wildlife	Adjusted	Percent of Change
BLUE MOUNTAIN LOCALITY											
Blue Mountain AMP	5825	0	0	0	0	0	0	0	0	0	0
Cub Creek	5823	0	0	0	0	0	0	0	0	0	0
Doc's Valley	5821	0	0	0	0	0	0	0	0	0	0
Green River	5820	0	-7	0	0	-7	0	0	0	-7	*) 1
Point of Pines	5822	0	0	0	0	0	0	0	0	0	0
Stuntz Valley	5824	0	0	0	0	0	0	0	0	0	0
Subtotal		0	0	-7	0	-7	0	0	0	-7	*) 1
BONANZA-RAINBOW LOCALITY											
Antelope Draw	5854	0	-27	0	0	-27	0	0	0	-27	*) 1
Asphalt Draw AMP	8817	0	-20	0	-2	-22	0	0	0	-22	*) 1
Badlands	5848	0	-4	0	0	-4	0	0	0	-4	*) 1
Baerer Wash	5832	0	-6	0	0	-6	0	0	0	-6	*) 1
Bohemian Bottoms	5840	0	-3	0	0	-3	0	0	0	-3	*) 1
Bonanza	5842	0	-9	0	-1	-10	0	0	0	-10	*) 1

\*) 1 = Percent of Change is less than one percent.



## SECTION B

## Current Management Alternative

Allotment Name and Number	Tar Sands	Oil Shale	Oil and Gas	Sand and Gravel	Gilsonite	Total Mineral Impacts	Land Treatments	AUM's for Wild-Horses	AUM's From Wild-life Adjusted in AUM's	Total Change in AUM's	Percent of Change
Brewer	8831	0	0	0	0	0	0	0	0	0	0
Cocklebur	5833	0	0	-6	0	-6	0	0	0	-6	1
Halfway Hill	5861	0	0	-3	0	-3	0	0	0	-3	1
Hells Hole	8819	0	0	-19	0	-19	0	0	0	-20	1
Jensen	5836	0	0	-3	0	-3	0	0	0	-3	1
K-Ranch	5849	0	0	-1	0	-1	0	0	0	-1	1
Kane Hollow	5837	0	0	-2	0	-2	0	0	0	-2	1
Little Emma	5852	0	0	-22	0	-22	0	0	0	-27	1
Miners Gulch	5838	0	0	-1	0	-1	0	0	0	-1	1
Olsen AMP	8816	0	0	-44	0	-44	0	0	0	-46	1
Powder Wash	5857	0	0	-10	0	-10	0	0	0	-10	1
Raven Ridge	5851	0	0	-5	0	-5	0	0	0	-5	1
Sand Wash	8818	0	0	-34	0	-34	0	0	0	-35	1
Seven Sisters	5845	0	0	-9	0	-9	0	0	0	-9	1
Snake John	5860	0	0	-6	0	-6	0	0	0	-6	1
Spring Hollow	5862	0	0	-2	0	-2	0	0	0	-2	1
Stateline	5863	0	0	-12	0	-12	0	0	0	-13	1
Stirrup AMP	5847	0	0	-2	0	-2	0	0	0	-2	1
Sunday School											
Canyon AMP	8814	0	0	-12	0	-12	0	0	0	-12	1
Walker Hollow	5839	0	0	-4	0	-4	0	0	0	-4	1
Watson	8815	0	0	-6	0	-6	0	0	0	-7	1
West Deadman	5841	0	0	-9	0	-9	0	0	0	-9	1
White River	8829	0	0	-1	0	-1	0	0	0	-1	1
White River Bottoms	5850	0	0	0	0	0	0	0	0	0	0
Subtotal		0	0	-282	0	-14	-296	0	0	-296	1



## SECTION B

## Current Management Alternative

Allotment Name and Number	Tar Sands	Oil and Shale	Oil and Gas	Sand and Gravel	Gilsonite	Total Mineral Impacts	Land Treatments	AUM's for Wild-Horses	AUM's From Wild-life	Total Change in AUM's	Percent of Change
BOOK CLIFFS LOCALITY											
Atchee Ridge AMP	8824	0	0	-41	0	-1	-42	0	0	-42	1
Book Cliffs Pasture	8828	0	0	-1	0	0	-1	0	0	-1	1
Davis Canyon	8823	0	0	-2	0	0	-2	0	0	-2	1
Horse Point AMP	8825	0	0	-11	0	0	-11	0	0	-11	1
McClelland	8826	0	0	-7	0	0	-7	0	0	-7	1
Sweetwater AMP	8822	0	0	-38	0	0	-38	0	0	-38	1
West Water Point	8833	0	0	-2	0	0	-2	0	0	-2	1
Winter Ridge	8827	0	0	-9	0	0	-9	0	0	-9	1
Subtotal		0	0	-111	0	-1	-112	0	0	-112	1
HILL CREEK LOCALITY											
Birchell	8804	0	0	0	0	0	0	0	0	0	0
Green River AMP	8803	0	0	-2	0	0	-2	0	0	-2	1
Hatch-Broome-											
Bartholomew	8805	0	0	0	0	0	0	0	0	0	0
Lower Showalter											
(Wild Horse Bench)	8811	0	0	-7	0	0	-7	0	0	-7	1
Oil Shale	8813	0	0	-5	0	0	-5	0	0	-5	1
Pack Mountain -											
Wildhorse *	8808	0	0	-8	0	0	-8	0	0	-8	1
Santio Sibello	8806	0	0	0	0	0	0	0	0	0	0
Tabyago	8801	0	0	-5	0	0	-5	0	0	-5	1
Thorne-Ute-											
Broome	8812	0	0	-1	0	0	-1	0	0	-1	1



SECTION B

Current Management Alternative

Allotment Name and Number	Tar Sands	Oil and Gas	Sand and Gravel	Gilsonite	Total Mineral Impacts	Land Treatments	AUM's for Wild-Horses	AUM's From Wild-life	Total Adjusted in	Percent of AUM's Change
Upper Showalter (Mustange)	0	0	0	0	0	0	0	0	0	0
Ute	0	0	0	0	-7	0	0	0	-7	1
West Tabyago AMP	0	0	-2	0	-2	0	0	0	-2	1
Subtotal	0	0	-37	0	-37	0	0	0	-37	1
TOTALS	0	0	-437	-15	-452	0	0	0	-452	1



# SECTION B

## Resource Protection Alternative Average Impacts

Allotment Name and Number	Tar Sands	Oil Shale	Oil and Gas	Sand and Gravel	Gil-site	Total Mineral Impacts	Land Treatments	Livestock Decreases* AUM's	Total Change in AUM's	Percent of Change
<b>BLUE MOUNTAIN LOCALITY</b>										
Blue Mountain AMP	5825	0	0	0	0	0	0	-124	-124	42
Cub Creek	5823	0	0	0	0	0	0	-10	-10	18
Doc's Valley	5821	0	0	0	0	0	0	-407	-407	22
Green River	5820	0	0	-7	0	-7	0	-1009	-1016	72
Point of Pines	5822	0	0	0	0	0	0	-285	-285	20
Stuntz Valley	5824	0	0	0	0	0	0	-268	-268	20
Subtotal		0	0	-7	0	-7	0	-2103	-2110	36
<b>BONANZA-RAINBOW LOCALITY</b>										
Antelope Draw	5854	0	0	-27	0	0	0	-3187	-3214	55
Asphalt Draw AMP	8817	0	-57	-20	0	-2	0	-2213	-2292	53
Badlands	5848	0	0	-4	0	0	0	-367	-371	48
Baerer Wash	5832	0	0	-6	0	0	0	-416	-422	34
Bohemian Bottoms	5840	0	0	-3	0	0	0	-38	-41	7
Bonanza	5842	0	0	-9	0	-1	0	-480	-490	25
Brewer	8831	0	0	0	0	0	0	-30	-30	25
Cocklebur	5833	0	0	-6	0	0	0	-897 <sup>a</sup>	-903	52
Halfway Hill	5861	0	0	-3	0	0	0	-93	-96	17
Hells Hole	8819	0	0	-19	0	-1	0	-2672	-2692	67
Jensen	5836	0	0	-3	0	0	0	-314 <sup>a</sup>	-317	46
K-Ranch	5849	0	0	-1	0	0	0	-	-1	1
Kane Hollow	5837	0	0	-2	0	0	0	-69	-71	17
Little Emma	5852	0	-69	-22	0	-5	0	-1716	-1812	40



## SECTION B

## Resource Protection Alternative

Allotment Name and Number	Tar Sands	Oil Shale	Oil and Gas	Sand and Gravel	Gil-site	Total Mineral Impacts	Land Treatments	Livestock Decreases* AUM's	Total Change in AUM's	Percent of Change
d Miners Gulch	5838	0	0	-1	0	-1	0	-121 <sup>a</sup>	-122	79
Olsen AMP	8816	0	-81	-44	-2	-127	0	-6673	-6800	74
Powder Wash	5857	0	0	-10	0	-10	0	-617 <sup>a</sup>	-627	30
Raven Ridge	5851	0	0	-5	0	-5	0	-282	-287	26
Sand Wash	8818	0	0	-34	-1	-35	0	-5477	-5512	78
Seven Sisters	5845	0	0	-9	0	-9	0	-899	-908	47
Snake John	5860	0	0	-6	0	-6	0	-347	-353	30
Spring Hollow	5862	0	0	-2	0	-2	0	-222	-224	50
Stataline	5863	0	0	-12	-1	-13	0	-1446	-1459	58
Stirrup AMP	5847	0	0	-2	0	-2	0	-75	-77	19
Sunday School										
Canyon AMP	8814	0	0	-12	0	-12	0	-1206	-1218	32
Walker Hollow	5839	0	0	-4	0	-4	0	-32	-36	5
Watson	8815	0	-6	-6	-1	-13	0	-210	-223	18
West Deadman	5841	0	0	-9	0	-9	0	-1044	-1053	54
White River	8829	0	0	-1	0	-1	0	0	-1	11
White River Bottoms	5850	0	0	0	0	0	0	-480	-480	100
Subtotal		0	-213	-282	-14	-509	0	-31623	-32132	52
BOOK CLIFFS LOCALITY										
Atchee Ridge AMP	8824	0	0	-41	-1	-42	+23	-2963	-2982	32
Book Cliffs Pasture	8828	0	0	-1	0	-1	0	-1	-2	11
Davis Canyon	8823	0	0	-2	0	-2	0	-	-2	11
Horse Point AMP	8825	0	0	-11	0	-11	+50	-1179	-1140	49
McClelland	8826	0	0	-7	0	-7	0	-369	-376	27
Sweetwater AMP	8822	-184	0	-38	0	-222	+395	-2223	-2050	28



## SECTION B

## Resource Protection Alternative

Allotment Name and Number	Tar Sands	Oil Shale	Oil and Gas	Sand and Gravel	Gilsonite	Total Mineral Impacts	Land Treatments	Livestock Decreases* AUM's	Total Change in AUM's	Percent of Change
West Water Point 8833	0	0	-2	0	0	-2	0	-77	-79	19
Winter Ridge 8827	-10	0	-9	0	0	-19	+15	-1127	-1131	57
Subtotal	-194	0	-111	0	-1	-306	+483	-7939	-7762	34
HILL CREEK LOCALITY										
Birchell 8804	0	0	0	0	0	0	0	-85	-85	100
Green River AMP 8803	0	0	-2	0	0	-2	0	-435	-437	100
Hatch-Broome-Bartholomew 8805	0	0	0	0	0	0	0	-54	-54	50
Lower Showalter (Wild Horse Bench) 8811	0	0	-7	0	0	-7	0	-1458	-1465	97
Oil Shale 8813	0	0	-5	0	0	-5	0	-1093	-1098	100
Pack Mountain - Wildhorse 8808	0	0	-8	0	0	-8	0	-580	-588	33
Santio Sibello 8806	0	0	0	0	0	0	0	-16	-16	17
Tabyago 8801	0	0	-5	0	0	-5	0	-1198	-1203	40
Thorne-Ute-Broome 8812	0	0	-1	0	0	-1	0	-124	-125	50
Upper Showalter (Mustange) 8810	0	0	0	0	0	0	0	-332	-332	83
Ute 8809	0	0	-7	0	0	-7	0	-1057	-1064	73
West Tabyago AMP 8807	0	0	-2	0	0	-2	0	-1110	-1112	76
Subtotal	0	0	-37	0	0	-37	0	-7549	-7586	60
TOTALS	-194	-213	-437	0	-15	-859	+483	-49207	-49583	



<sup>a</sup>Includes changes from Appendix 5 (Forage Actions by Alternative) for deer populations in herd unit 26.

<sup>b</sup>Part of deer herd unit 26 falls within the Bonanza area.

<sup>c</sup>Thirty percent of this allotment is included within deer herd unit 26.

<sup>d</sup>Twenty percent of this allotment is included within deer herd unit 26.

<sup>e</sup>This allotment falls within deer herd unit 26.

\*These decreases are to improve ecological condition through reduced spring grazing, to allocate forage for wild horses, to provide forage for present and potential wildlife, to improve riparian habitat, and 100-year floodplain and to limit livestock to average use (see Appendix 5, Forage Actions by Alternative).



## SECTION B

Commodity Production Alternative  
Average ImpactsLivestock AUM's

Allotment Name and Number	Tar Sands	Oil Shale	Oil and Gas	Sand and Gravel	Gil- son- ite	Total Mineral Impacts	Land Treat- ments	AUM's for Wild- Horses	AUM's From Wild- life Adjud- icated AUM's	Total Change in AUM's	Percent of Change
BLUE MOUNTAIN LOCALITY											
Blue Mountain AMP <sup>a</sup>	0	0	0	0	0	0	+140 <sup>b</sup>	0	0	+140	48
Cub Creek	0	0	0	0	0	0	0	0	+9	+9	16
Doc's Valley	0	0	0	0	0	0	+442 <sup>b</sup>	0	0	+442	36
Green River	0	0	-7	-2	0	-9	0 <sup>b</sup>	0	+56	+47	3
Point of Pines	0	0	0	0	0	0	0 <sup>b</sup>	0	0	0	0
Stuntz Valley	0	0	0	0	0	0	0 <sup>b</sup>	0	0	0	0
Subtotal	0	0	-7	-2	0	-9	+582 <sup>b</sup>	0	+65	+638	11
BONANZA-RAINBOW LOCALITY											
Antelope Draw	0	0	-27	0	0	-27	0	0	+27	0	0
Asphalt Draw AMP	-55	-41	-20	-2	-2	-120	0	0	+260	+140	3
Badlands	0	0	-4	0	0	-4	0	0	+4	0	0
Baerer Wash	0	0	-6	-5	0	-11	0	0	+11	0	0
Bohemian Bottoms	0	0	-3	-4	0	-7	0	0	+7	0	0
Bonanza	0	-13	-9	0	-1	-23	0	0	+23	0	0
Brewer	0	0	0	0	0	0	0	0	+2	+2	1
Cocklebur	0	0	-6	0	0	-6	0	0	+6	0	0
Halfway Hill	0	0	-3	-4	0	-7	0	0	+7	0	0
Hells Hole	0	-2	-19	-1	-1	-23	0	0	+23	0	0
Jensen	0	0	-3	-7	0	-10	0	0	+10	0	0
K-Ranch	0	0	-1	0	0	-1	0	0	+1	0	0
Kane Hollow	0	0	-2	-3	0	-5	0	0	+5	0	0



## SECTION B

## Commodity Production Alternative

Allotment Name and Number	Tar Sands	Oil Shale	Oil and Gas	Sand and Gravel	Gil-site	Total Mineral Impacts	Land Treatments	AUM's for Wild-Horses	AUM's Adjusted in life	Total Change in AUM's	Percent of Change
Little Emma	5852	0	-36	-22	-3	-5	-66	0	+66	0	0
Miners Gulch	5838	0	0	-1	0	0	-1	0	+1	0	0
Olsen AMP	8816	-13	-35	-44	-2	-2	-96	0	+422	+326	4
Powder Wash	5857	0	0	-10	-4	0	-14	0	+14	0	0
Raven Ridge	5851	0	0	-5	0	0	-5	0	0	+63	6
Sand Wash	8818	0	-25	-34	0	-2	-61	0	+170	+109	2
Seven Sisters	5845	0	-13	-9	-2	0	-24	0	+24	0	0
Snake John	5860	0	0	-6	0	0	-6	0	+6	0	0
Spring Hollow	5862	0	0	-2	-1	0	-3	0	+3	0	0
Stateline	5863	0	-1	-12	0	-1	-14	0	+14	0	0
Stirrup AMP	5847	0	0	-2	-7	0	-9	0	+9	0	0
Sunday School											
Canyon AMP	8814	-222	0	-12	0	0	-234	0	+256	+22	1
Walker Hollow	5839	0	0	-4	-1	0	-5	0	+5	0	0
Watson	8815	0	0	-6	0	-1	-7	0	+48	+41	3
West Deadman	5841	0	0	-9	0	0	-9	0	+9	0	0
White River	8829	0	0	-1	0	0	-1	0	+1	0	0
White River Bottoms	5850	0	0	0	0	0	0	0	0	0	0
Subtotal		-290	-166	-282	-46	-15	-799	0	+1434	+703	1
BOOK CLIFFS LOCALITY											
Atchee Ridge AMP	8824	-350	0	-41	0	-1	-392	0	+1924	+2302	24
Book Cliffs Pasture	8828	-58	0	-1	0	0	-59	0	+60	+1	1
Davis Canyon	8823	0	0	-2	0	0	-2	0	+2	0	0
Horse Point AMP	8825	0	0	-11	0	0	-11	-171	+675	+996	42
McClelland	8826	0	0	-7	0	0	-7	0	+7	0	0



## SECTION B

## Commodity Production Alternative

Allotment Name and Number	Tar Sands	Oil Shale	Oil and Gas	Sand and Gravel	Gil-sonite	Total Mineral Impacts	Land Treatments	AUM's for Wild-Horses	AUM's From Wild-Life	Total Change in AUM's	Percent of Change
Sweetwater AMP	8822	-670	0	-38	0	0	-708 +383	0	+1864	+1539	21
West Water Point	8833	0	0	-2	0	0	-2	0	+2	0	0
Winter Ridge	8827	-277	0	-9	0	0	-286 +180	0	+480	+374	19
Subtotal		-1355	0	-111	0	-1	-1467 +1836	-171	+5014	+5212	23
HILL CREEK LOCALITY											
Birchell	8804	0	0	0	0	0	0	0	0	+8	9
Green River AMP	8803	0	0	-2	-1	0	-3	0	+3	0	0
Hatch-Broome-											
Bartholomew	8805	0	0	0	0	0	0	0	0	0	0
Lower Showalter											
(Wild Horse Bench)	8811	0	0	-7	0	0	-7	0	+7	0	0
Oil Shale	8813	0	0	-5	0	0	-5	0	+5	0	0
Pack Mountain -											
Wildhorse	8808	0	0	-8	0	0	-8	0	+8	0	0
Santio Sibello	8806	0	0	0	0	0	0	0	0	0	0
Tabyago	8801	0	0	-5	0	0	-5 +50	-140	+95	0	0
Thorne-Ute-											
Broome	8812	0	0	-1	0	0	-1	0	+1	0	0
Upper Showalter											
(Mustange)	8810	0	0	0	0	0	0	-117	+25	0	0
Ute	8809	0	0	-7	0	0	-7 +41	-24	0	+10	1
West Tabyago AMP	8807	0	0	-2	0	0	-2 +125	-258	+135	0	0
Subtotal		0	0	-37	-1	0	-38 +316	-539	+279	+18	1
TOTALS		-1645	-166	-437	-49	-16	-2313 +2802	-710	+7186	+6571	7

<sup>a</sup>The Blue Mountain AMP currently authorizes 140 AUM's above adjudicated AUM's on a temporary nonrenewable basis.  
<sup>b</sup>There would be an unknown amount of forage increase. Land treatments would be similar to amounts treated at the time of adjudication (Blue Mountain Locality).



## SECTION B

Balanced Use Alternative  
Average ImpactsLivestock AUM's

Allotment Name and Number	Tar Sands	Oil Shale	Oil and Gas	Sand and Gravel	Gilsonite	Total Mineral Impacts	Land Treatments	AUM's for Wild-Horses	AUM's From Wildlife	Total Change in AUM's	Percent of AUM's Change
BLUE MOUNTAIN LOCALITY											
Blue Mountain AMP	5825	0	0	0	0	0	+33 <sup>e</sup>	0	0	+33 <sup>a</sup>	11
Cub Creek	5823	0	0	0	0	0	0	0	-1	-1 <sup>a</sup>	2
Doc's Valley	5821	0	0	0	0	0	0 <sup>e</sup>	0	0	0 <sup>a</sup>	0
Green River	5820	0	0	-7	0	-7	0 <sup>e</sup>	0	-97	-104 <sup>a</sup>	7
Point of Pines	5822	0	0	0	0	0	0 <sup>e</sup>	0	-4	-4 <sup>a</sup>	3
Stuntz Valley	5824	0	0	0	0	0	0 <sup>e</sup>	0	0	0 <sup>a</sup>	0
Subtotal		0	0	-7	0	-7	+33 <sup>e</sup>	0	-102	-76 <sup>a</sup>	1
BONANZA-RAINBOW LOCALITY											
Antelope Draw	5854	0	0	-27	0	-27	0	0	-2579	-2606	45
Asphalt Draw AMP	8817	0	-20	-20	0	-42	0	0	-1639	-1681	39
Badlands	5848	0	0	-4	0	-4	0	0	-35	-39	5
Baerer Wash	5832	0	0	-6	-3	-9	0	0	-132	-141	11
Bohemian Bottoms	5840	0	0	-3	-2	-5	0	0	0	-5	1
Bonanza	5842	0	0	-9	0	-10	0	0	-115	-125	6
Brewer	8831	0	0	0	0	0	0	0	0	0	0
Cocklebur	5833	0	0	-6	0	-6	0	0	-573	-579 <sup>a</sup>	33
Halfway Hill	5861	0	0	-3	-2	-5	0	0	0	-5	1
Hells Hole	8819	0	-3	-19	-1	-24	0	0	-2479	-2503	62
Jensen	5836	0	0	-3	-3	-6	0	0	-1	-7 <sup>a</sup>	1
K-Ranch	5849	0	0	-1	-2	-3	0	0	-	-3	1



## SECTION B

## Balanced Use Alternative

Allotment Name and Number	Tar Sands	Oil and Shale Gas	Oil and Gas	Sand and Gravel	Gil-site	Total Mineral Impacts	Land Treatments	AUM's for Wild-Horses	AUM's From Wild-life	Total Change in AUM's	Percent of Change
Kane Hollow	5837	0	0	-2	-2	-4	0	0	-45	-49	11
Little Emma	5852	0	-58	-22	0	-85	0	0	-924	-1009	22
Miners Gulch	5838	0	0	-1	0	-1	0	0	-53 <sup>a</sup>	-54	35
Olsen AMP	8816	0	-50	-44	0	-96	0	0	-5768	-5864	64
Powder Wash	5857	0	0	-10	-3	-13	0	0	-182 <sup>a</sup>	-195	9
Raven Ridge	5851	0	0	-5	0	-5	+68	0	-74	-11	11
Sand Wash	8818	0	-25	-34	0	-61	0	0	-5106	-5167	74
Seven Sisters	5845	0	-22	-9	0	-31	0	0	-766	-797	42
Snake John	5860	0	0	-6	0	-6	0	0	-145	-151	13
Spring Hollow	5862	0	0	-2	-1	-3	0	0	0	-3	11
Stateline	5863	0	0	-12	0	-13	0	0	-1258	-1271	51
Stirrup AMP	5847	0	0	-2	-5	-7	0	0	0	-7	2
Sunday School											
Canyon AMP	8814	-61	-27	-12	0	-100	0	0	-679	-779	21
Walker Hollow	5839	0	0	-4	-1	-5	0	0	-27	-32	4
Watson	8815	0	-2	-6	0	-9	0	0	0	-9	11
West Deadman	5841	0	0	-9	0	-9	0	0	-838	-847	44
White River	8829	0	0	-1	0	-1	0	0	0	-1	11
White River Bottoms	5850	0	0	0	0	0	0	0	-1	-1	11
Subtotal		-61	-207	-282	-25	-590	+68	0	-23315	-23941	39

## BOOK CLIFFS LOCALITY

Atchee Ridge AMP	8824	0	0	-41	0	-42	+42	0	-2373	-2373	25
Book Cliffs Pasture	8828	0	0	-1	0	-1	0	0	0	-1	11
Davis Canyon	8823	0	0	-2	0	-2	0	0	-	-2	11
Horse Point AMP	8825	0	0	-11	0	-11	+182	-171	-948	-948	40



## SECTION B

## Balanced Use Alternative

Allotment Name and Number	Tar Sands	Oil Shale	Oil and Gas	Sand and Gravel	Gil- son- ite	Total Mineral Impacts	Land Treat- ments	AUM's for Wild- Horses	AUM's From Wild- life Adjud- icated AUM's	Total Change in AUM's	Percent of Change
McClelland	8826	0	0	-7	0	-7	0	0	-166	-173	12
Sweetwater AMP	8822	-475	0	-38	0	-513	+230	0	-1171	-1454	20
West Water Point	8833	0	0	-2	0	-2	0	0	-75	-77	18
Winter Ridge	8827	-1	0	-9	0	-10	+10	0	-797	-797	40
Subtotal	-476	0	-111	0	-1	-588	+464	-171	-5530	-5825	26
HILL CREEK LOCALITY											
Birchell	8804	0	0	0	0	0	0	0	0	0	0
Green River AMP	8803	0	0	-2	0	-2	0	0	0	-2	1
Hatch-Broome-											
Bartholomew	8805	0	0	0	0	0	0	0	0	0	0
Lower Showalter											
(Wild Horse Bench)	8811	0	0	-7	0	-7	0	-180	-1271	-1458	97
Oil Shale	8813	0	0	-5	0	-5	0	-90	-1003	-1098	100
Pack Mountain -											
Wildhorse	8808	0	0	-8	0	-8	0	-120	-319	-447	56
Santio Sibello	8806	0	0	0	0	0	0	0	0	0	0
Tabyago	8801	0	0	-5	0	-5	0	-660	-333	-998	33
Thorne-Ute-											
Broome	8812	0	0	-1	0	-1	0	0	0	-1	1
Upper Showalter											
(Mustange)	8810	0	0	0	0	0	+42	-180	-127	-265	67
Ute	8809	0	0	-7	0	-7	0	-216	-753	-976	67
West Tabyago AMP	8807	0	0	-2	0	-2	0	-720	-224	-946	39
Subtotal	0	0	-37	0	0	-37	+42	-2166	-4030	-6191	50
TOTALS	-537	-207	-437	-25	-16	-1222	+607	-2337	-32977	-36033	35



- <sup>a</sup>Includes changes from Appendix 5 (Forage Actions by Alternative) for deer populations (herd unit 26). Part of deer herd unit 26 falls within the Bonanza area.
- <sup>b</sup>Thirty percent of this allotment is included within deer herd unit 26.
- <sup>c</sup>Twenty percent of this allotment is included within deer herd unit 26.
- <sup>d</sup>This allotment falls within deer herd unit 26.
- <sup>e</sup>There would be an unknown amount of forage increase. Treatment would be similar to amounts treated and accounted for at the time of adjudication in the Blue Mountain Locality.



## SECTION C

Potential Impacts to Wildlife by Alternative  
Expressed in AUMs

ALTERNATIVE LOCALITY	Tar Sands	Oil Shale	Oil and Gas	Sand Gravel	Gilsonite	Total Mineral Impacts	Land Treatments	From Adjudicated AUMs	Total Change
CURRENT MANAGEMENT ALTERNATIVE									
Blue Mountain	0	0	0	0	0	0	0	0	0
Bonanza-Rainbow	0	0	-12	0	0	-12	0	0	-12
Book Cliffs	0	0	-111	0	-1	-112	+300	0	+188
Hill Creek	0	0	0	0	0	0	0	0	0
TOTAL	0	0	-123	0	-1	-124	+300	0	+176
RESOURCE PROTECTION ALTERNATIVE									
Blue Mountain	0	0	0	0	0	0	0	+885	+885
Bonanza-Rainbow	0	-12	-13	0	0	-25	0	+24,226	+24,201
Book Cliffs	-185	0	-111	0	-1	-297	+1,225	+5,823	+6,751
Hill Creek	0	0	0	0	0	0	0	+6,183	+6,183
TOTAL	-185	-12	-124	0	-1	-322	+1,225	+37,117	+38,020
COMMODITY PRODUCTION ALTERNATIVE									
Blue Mountain	0	0	-1	0	0	-1	0	-65	-66
Bonanza-Rainbow	-35	-12	-13	0	0	-60	0	-1,434	-1,489
Book Cliffs	-1,355	-15	-111	0	-1	-1,482	0	-5,471	-6,682
Hill Creek	0	0	0	0	0	0	0	-279	-279
TOTAL	-1,390	-27	-125	0	-1	-1,543	0	-7,643	-9,181
BALANCED USE ALTERNATIVE									
Blue Mountain	0	0	-1	0	0	-1	+549*	+102	+650
Bonanza-Rainbow	-20	-15	-13	0	0	-48	0	+23,315	+23,256
Book Cliffs	-475	0	-111	0	-1	-587	+942	+5,530	+5,885
Hill Creek	0	0	0	0	0	0	+8	+4,030	+4,038
TOTAL	-495	-15	-125	0	-1	-636	+1,499	+32,977	+33,840

\*There would be an unknown additional increase. Treatments would be similar to amounts treated and accounted for at the time of adjudication in the Blue Mountain Locality.





# APPENDIX 16

## ANTICIPATED CHANGE IN ECOLOGICAL CONDITION CLASS

	% Excellent	% Good	% Fair	% Poor	% Badland & Rock Outcrop
<b>BLUE MOUNTAIN LOCALITY</b>					
83' Inventory Baseline	5	54	21	2	18
Current Management Alternative	5	45	30	2	18
Resource Protection Alternative	6	62	12	2	18
Commodity Production Alternative	8	55	17	2	18
Balanced Use Alternative	13	55	13	1	18
<b>BONANZA RAINBOW LOCALITY</b>					
83' Inventory Baseline	4	39	41	1	15
Current Management Alternative	4	42	38	1	15
Resource Protection Alternative	4	49	31	1	15
Commodity Production Alternative	4	40	40	1	15
Balanced Use Alternative	4	44	36	1	15
<b>BOOK CLIFFS LOCALITY</b>					
83' Inventory Baseline	15	57	20	0	8
Current Management Alternative	16	58	18	0	8
Resource Protection Alternative	21	59	12	0	8
Commodity Production Alternative	15	60	17	0	8
Balanced Use Alternative	19	60	13	0	8
<b>HILL CREEK LOCALITY</b>					
83' Inventory Baseline	3	50	25	3	19
Current Management Alternative	3	52	23	3	19
Resource Protection Alternative	3	53	22	3	19
Commodity Production Alternative	3	53	23	2	19
Balanced Use Alternative	3	51	24	3	19
<b>TOTAL OF ALL LOCALITIES</b>					
83' Inventory Baseline	7	46	32	1	14
Current Management Alternative	7	48	30	1	14
Resource Protection Alternative	8	53	24	1	14
Commodity Production Alternative	7	47	31	1	14
Balanced Use Alternative	7	50	28	1	14

Source: Anticipated Changes in Ecological Condition. Technical Report on File Vernal District BLM.











01973

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Cliffs resource  
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BORROWER	OFFICE	DATE RETURNED
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(Continued on reverse)



 BLUE MOUNTAIN LOCALITY  
 BONANZA-RAINBOW LOCALITY  
 HILL CREEK LOCALITY  
 ROOK CLIFFS LOCALITY  
 ALLOTMENT BOUNDARY  
 PASTURE BOUNDARY





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(January 1978)

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